Nokia Customer Care
RH-47 Cellular Phones

3 - Service Software Instructions

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Table of Contents

Page No

Phoenix Service Software 4
Supported Operating System 4
Hardware requirements for using Phoenix 4
Installing Phoenix 4
Before you start 4
Startup 5
Updating Phoenix 9
Uninstalling Phoenix 11
Software Update / Re-Flashing Setups 14
POS setup with FLS-4S 14
FPS-8 / SF-20 software update setup 15
DA-17 software update setup 16
MJ-21 software update setup 17
Connecting FPS-8 to PC 18
Activating FPS-8 18
Checking application software version inside FPS-8 18
RE-Flashing Procedure 21
Flashing with FPS-8 21
Flashing with FLS-4S 25
Installing Data Package 26
Uninstalling data package 29
Phoenix Self Tests 31
Phoenix Tuning 32
Energy management calibration 32
Rx/Tx Tuning 35
RF tuning setup DA-17 36
MJ-21 tuning setup 37
Start tuning with Phoenix: 38
RF tuning after repairs 38
Rx channel select filter calibration 39
RX calibration (incl. VCXO-calibration) 39
AGC-calibration 40
VCXO-calibration 40
RX AGC limits 44
Rx band filter response compensation 45
TX I/Q tuning 48
Tx power level tuning 53
RF autotuning 57
Setup Diagrams 58
Autotune procedure 65
Bluetooth Bit Error Rate Test 68
Hardware needed to use JBT-9 68
JBT-9 test box 68
JBT-9 test range 68
Performing BER test 68
BER test with DA-17 69
BER test with MJ-21 71

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Testing instructions for BER testing 72
Additional menu functions 73
JBT-9 attenuation setting via jumper 73
LED Indication of JBT-9 74
Audio Test 75
Setup diagram 75
Audio test procedure 76
Audio signal routing 78
Phoenix Error Codes 80

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Phoenix Service Software

Phoenix is the new generation service software. It has been designed to meet the challenges in servicing modern cellular phone technology.

The Phoenix program has been built using component architecture. This means that the actual program is small and most of the program's functionality is divided into dynamically loaded modules (DLLs).

Supported Operating System

Windows 98SE, ME, 2000, and XP

Hardware requirements for using Phoenix

Minimum:

Processor 233 MHz, RAM memory 64 MB, Disk space > 200 MB (depending on installed data packages)

Recommended for Windows 2000:

Processor 700 MHz, RAM memory 512MB, Disk space > 200 MB (depending on installed data packages)

Installing Phoenix

This section briefly describes how to install the Phoenix software and includes some basic information on how to use the program. For more detailed information, please refer the Phoenix's **Help files.** Each feature in Phoenix has its own Help function, which can be activated while running the program.

Press the F1 key or the feature's Help button to activate a Help file.

Before you start

- Check that the dongle is attached to the parallel port of your PC.
- Download the installation package (e.g. *phoenix_service_sw_a10_2003_33_5_22.exe)* to your PC.
- Close all other programs.
- Double-click the installation file (see above) and follow the instructions on the screen.
- Depending on the operating system, you may require administrator rights to be able to install Phoenix.
- If the dongle driver is installed or updated, you need to reboot your PC before the installation can continue.
- If uninstalling or rebooting is needed at any point, you will be prompted by the Install Shield Wizard.
- If at any point during installation you get this message:

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Dongle is not found and installation cannot continue.

possible reasons may be a defective or too old PKD-1 dongle (five digit serial number dongle when used with the FPS-8 prommer) or that the FLS-4S POS flash dongle is defective or power to it is not supplied by an external charger.

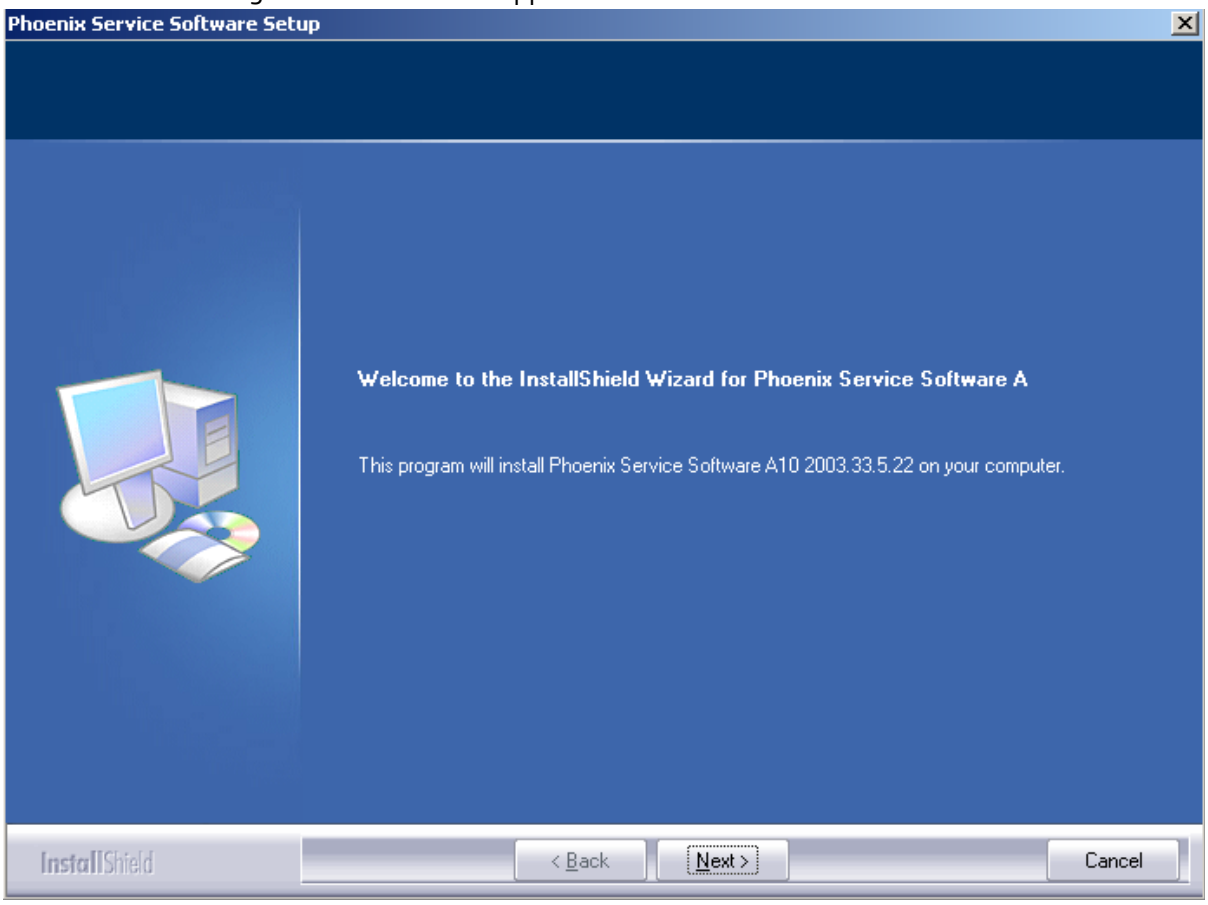
Check the COM/ parallel ports used first. After correcting the problem restart the installation!

Startup

To start installation:

1 Double-click the **phoenix_service_sw_a10_2003_33_5_22.exe** icon.

The following welcome window appears:


Phoenix Service Software Setup
Welcome to the InstallShield Wizard for Phoenix Service Software A
This program will install Phoenix Service Software A10 2003.33.5.22 on your computer.
InstallShield
< Back
Next >
Cancel

2 Choose the destination folder.

It is recommended to use the default folder. You can choose the destination folder manually by clicking **Browse**, but this is not recommended.

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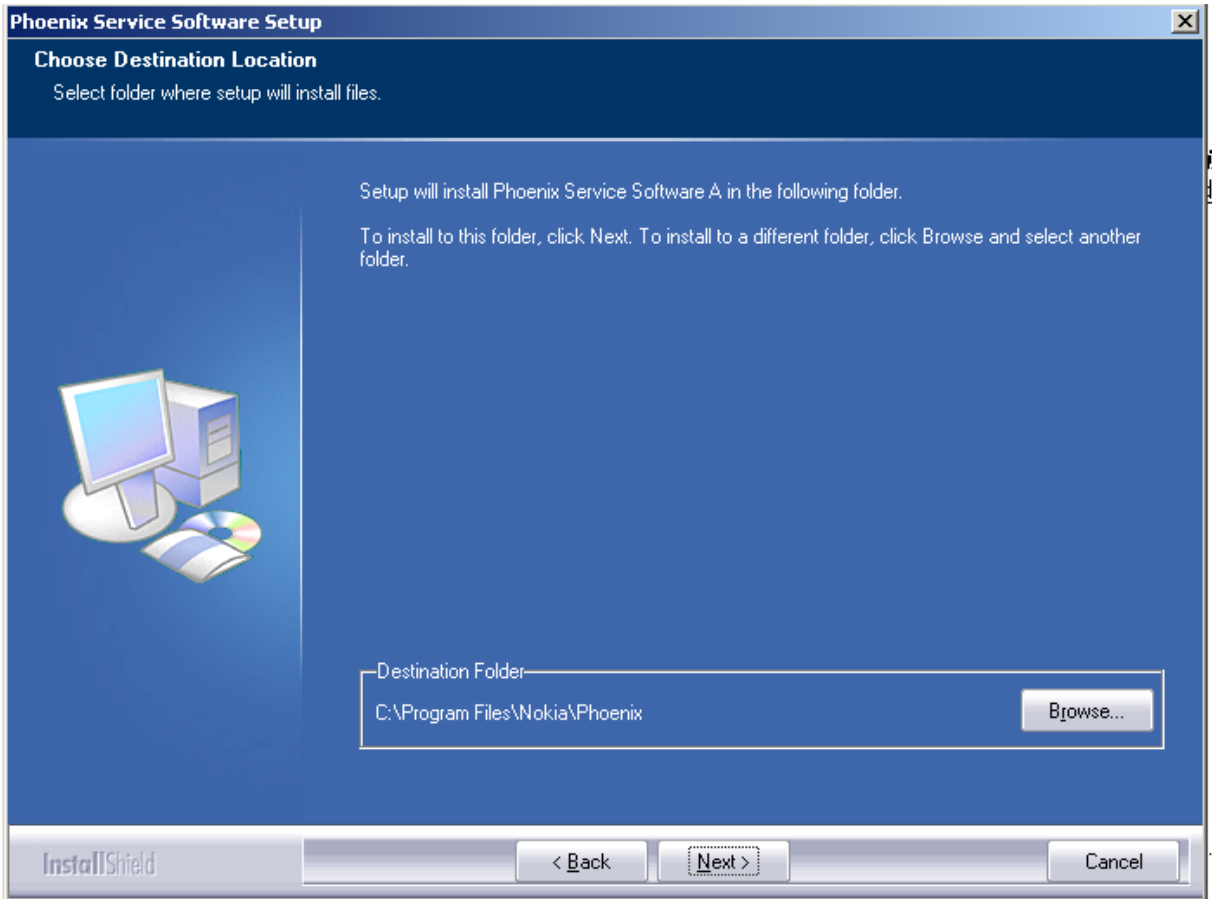
3 To continue, click Next.


Phoenix Service Software Setup
Choose Destination Location
Select folder where setup will install files.
Setup will install Phoenix Service Software A in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\Program Files\Nokia\Phoenix
Browse...
InstallShield
< Back
Next >
Cancel

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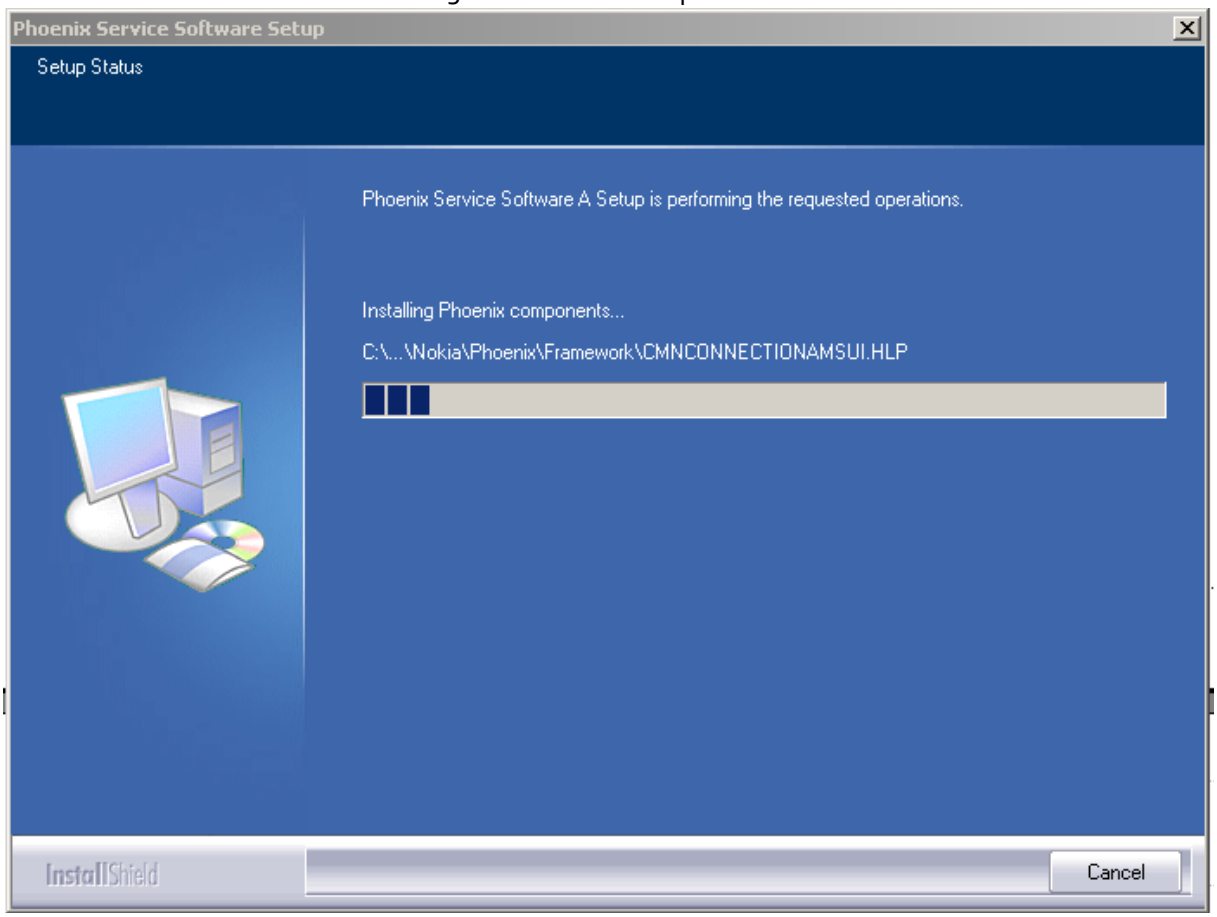
Install shield starts installing the Phoenix components. Please wait.



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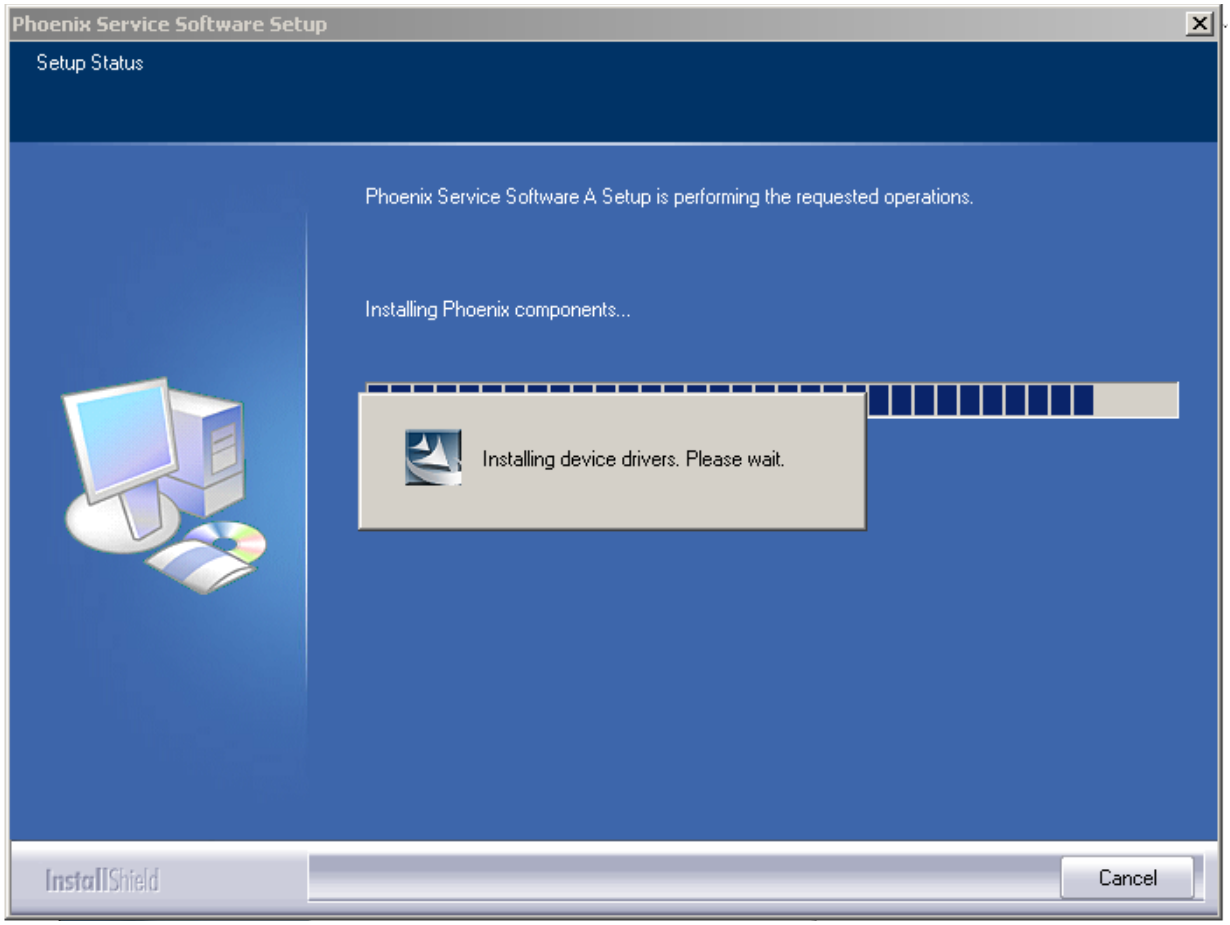
Install shield registers the Phoenix components. Please wait.



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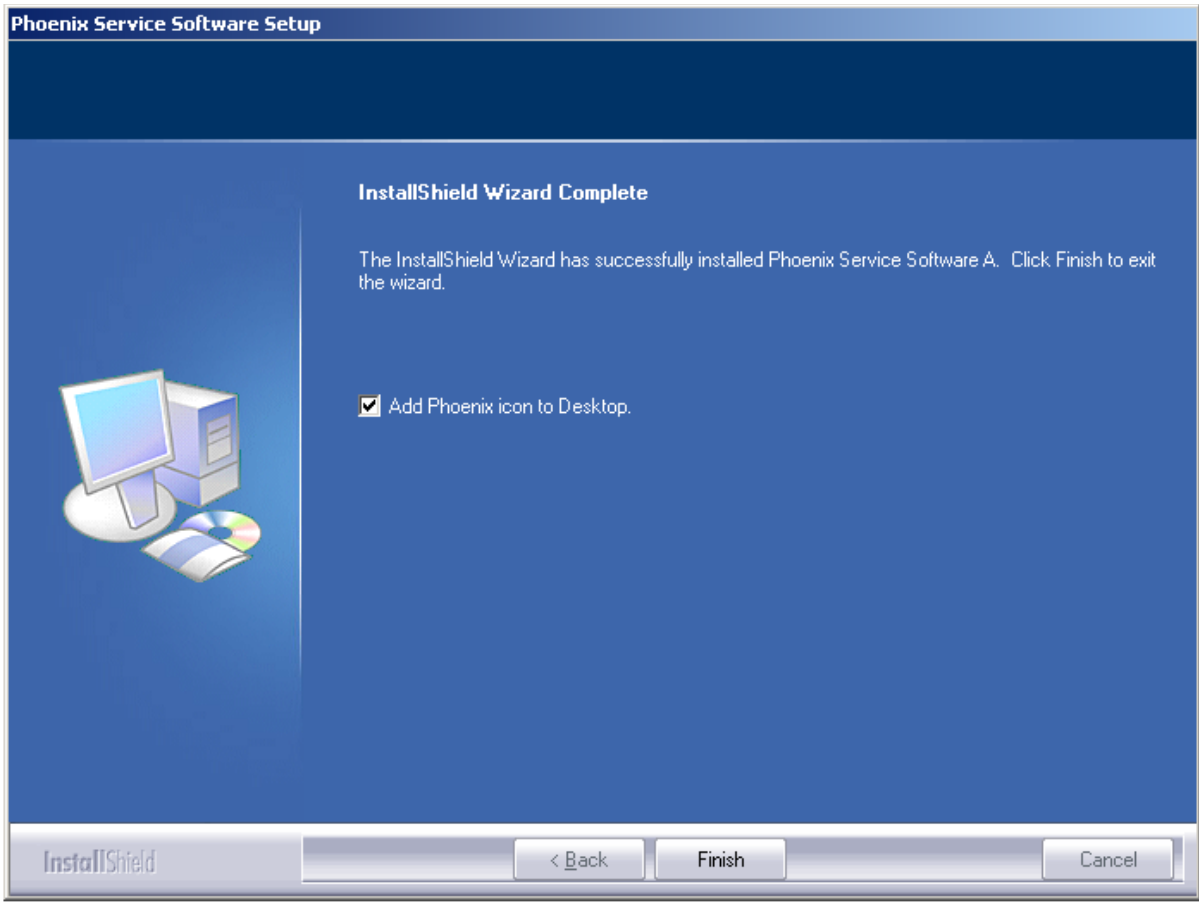
4 When installation is finished, you get the following window:


Phoenix Service Software Setup
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed Phoenix Service Software A. Click Finish to exit the wizard.
Add Phoenix icon to Desktop.
InstallShield
< Back
Finish
Cancel

To complete the installation, click **Finish**.

The installation of Phoenix service SW is ready and it can be used after:

- Installing the phone model specific data package
- Configuring the connections

Updating Phoenix

If you have already installed Phoenix on your PC, sooner or later there will be need to update it when a new version is released.

Please note that very often the Phoenix Service SW and the phone specific data packages for Phoenix come in pairs, meaning that a certain version of Phoenix can only be used with a certain version of a data package. Always use the latest available versions of both. Instructions can be found in the phone model specific technical bulletins.

To update Phoenix you need to take exactly the same steps as when installing it for the first time:

1 Download the installation package.

2 Close all other programs.

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3 Run the installation package (e.g. *phoenix_service_sw_a10_2003_33_5_22.exe).*

Dongle driver is checked and if need be, updated.

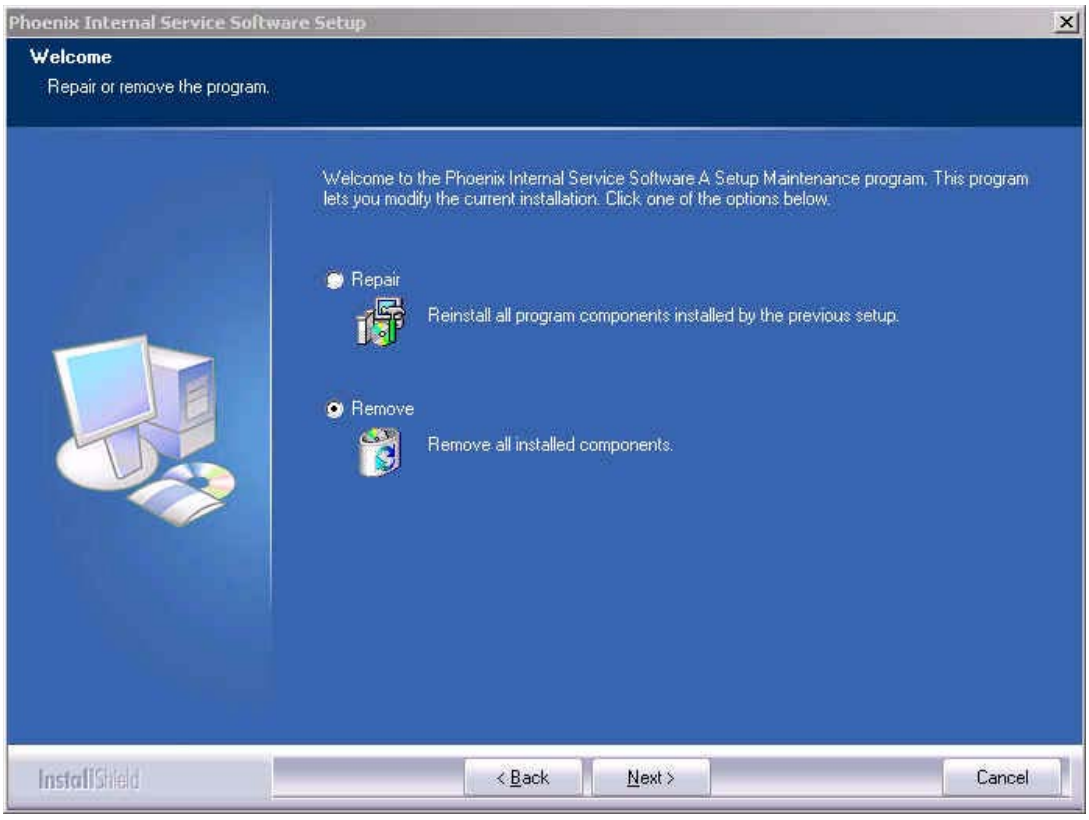
If the dongle driver is updated the system reboots. After reboot installation starts automatically.

The newer version of Phoenix is installed.

When you update Phoenix from old to new version (e.g. update from *2003_25_1_26 to 2003_33_5_22)* installation takes place automatically without uninstallation.

If you try to install an older version (e.g. downgrade from *2003_33_5_22 to 2003_25_1_26*) installation will be interrupted.

If you try to update Phoenix with the same version that you already have (e.g. *2003_33_5_22 to 2003_33_5_22)* the following window will appear:


Phoenix Internal Service Software Setup
Welcome
Repair or remove the program.
Welcome to the Phoenix Internal Service Software A Setup Maintenance program. This program lets you modify the current installation. Click one of the options below.
Repair
Reinstall all program components installed by the previous setup.
Remove
Remove all installed components.
InstallShield
< Back
Next >
Cancel

4 To uninstall Phoenix, click Next. Click Cancel to abort uninstallation.

If you want to reinstall Phoenix select the **Repair** button and click Next. Phoenix is installed again and you get the following window at the end of the rein-

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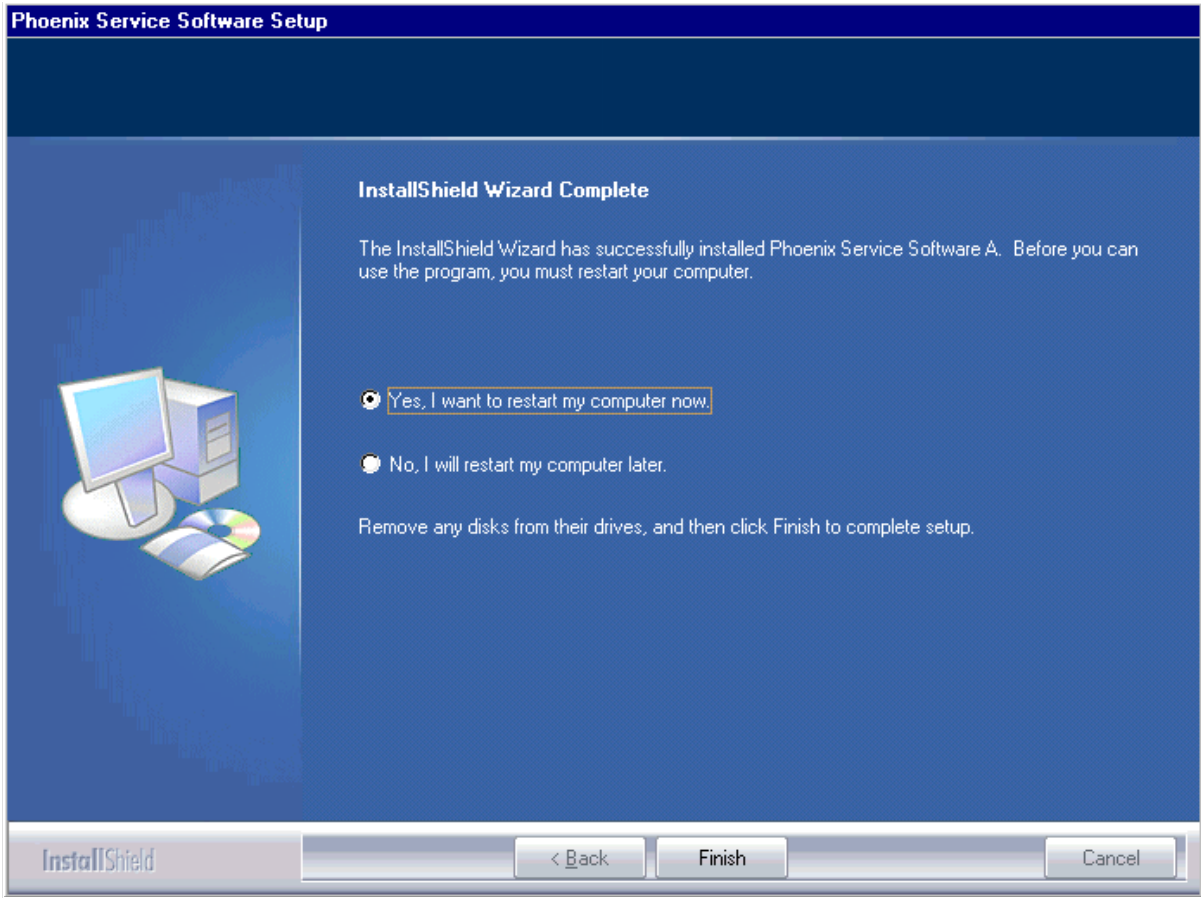
stallation:


Phoenix Service Software Setup
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed Phoenix Service Software A. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

5 To reboot the PC, click Finish.

Uninstalling Phoenix

To uninstall Phoenix manually from Windows:

1 Go to Control Panel and double-click Add/Remove Programs.

2 Select “Phoenix Service Software A” and click “Add/Remove”.

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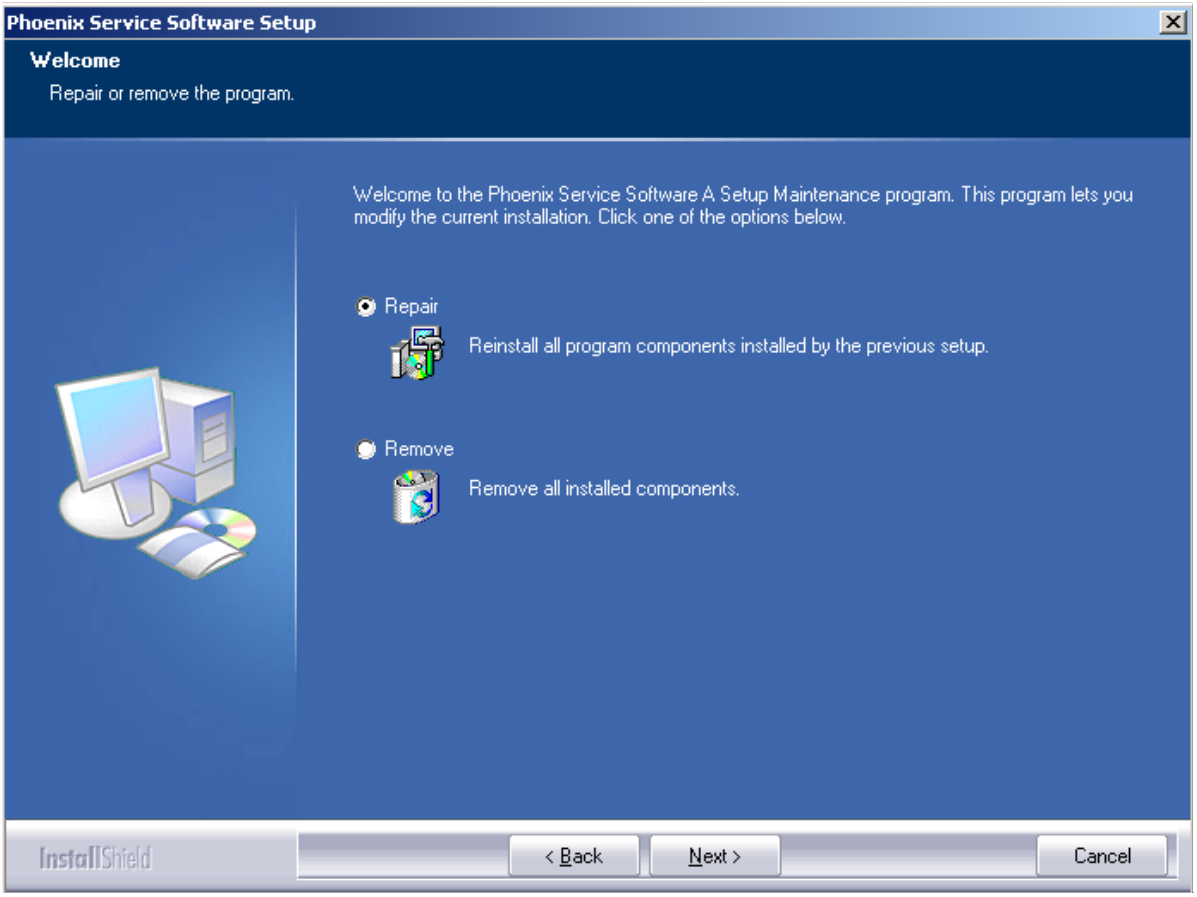
The following window appears:


Phoenix Service Software Setup
Welcome
Repair or remove the program.
Welcome to the Phoenix Service Software A Setup Maintenance program. This program lets you modify the current installation. Click one of the options below.
Repair
Reinstall all program components installed by the previous setup.
Remove
Remove all installed components.
InstallShield
< Back
Next >
Cancel

3 To uninstall, click Next.

The progress of the uninstallation is shown.

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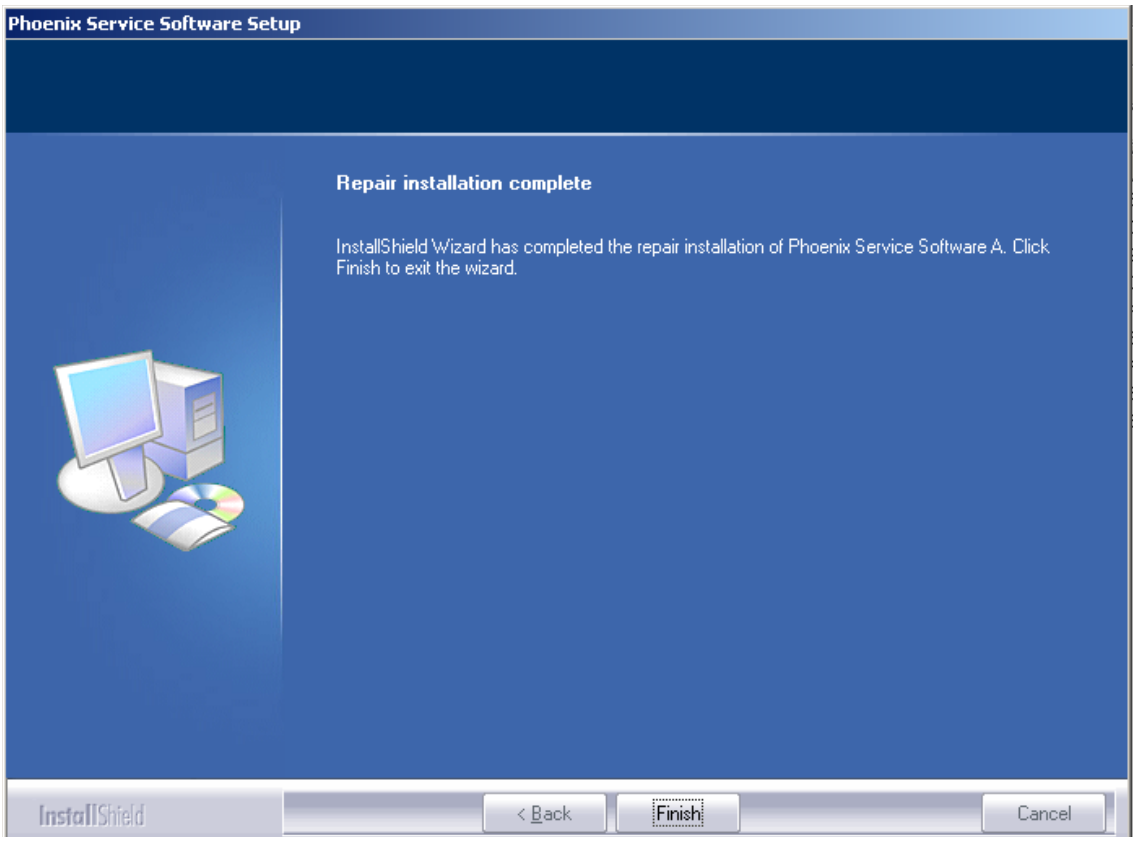
4 After uninstallation, you have to reboot PC. Click Finish:


Phoenix Service Software Setup
Repair installation complete
InstallShield Wizard has completed the repair installation of Phoenix Service Software A. Click Finish to exit the wizard.
InstallShield
< Back
Finish
Cancel

After restarting the PC, the uninstallation of Phoenix is finished.

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Software Update / Re-Flashing Setups

The following setup diagrams shows how to connect the different service devices when flashing the RH-47 phone. Make sure that you have selected the right one before proceeding.

POS setup with FLS-4S

As a main interface either a USB or a parallel port can be used. See figures below:

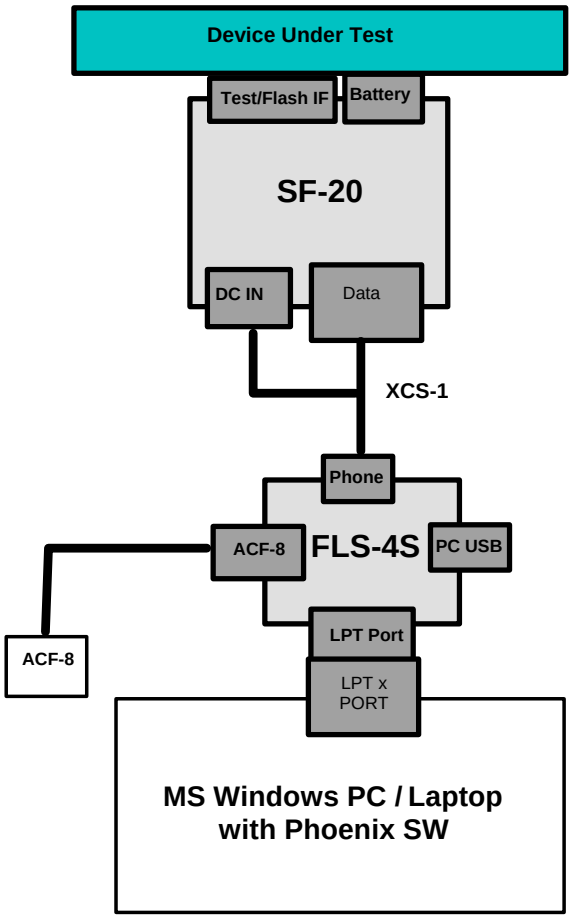

Figure 1: USB interface setup

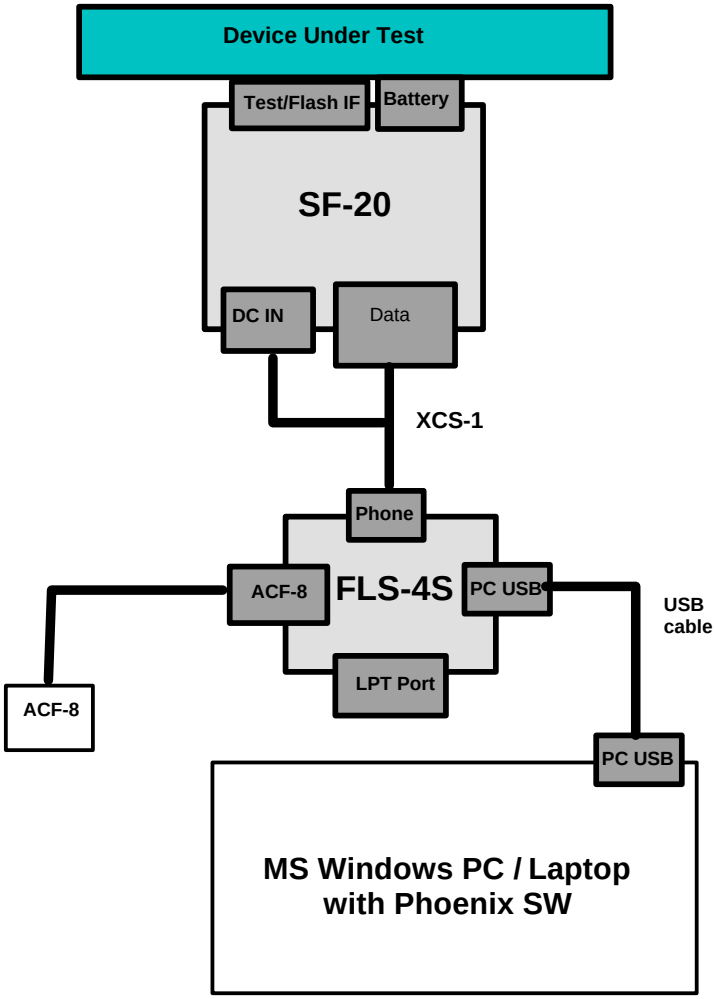

Figure 2: Parallel port setup

Item	Type designation	Code	Description
1	FLS-4S	0080543	POS flash prommer for US incl. ACF-8 Power supply
2	SF-20	0770702	POS flash adapter
3	XCS-1	0730218	Service cable with data & power connection for FLS-4S
4	ACF-8	0680032	Power Supply (Part of 0080543)

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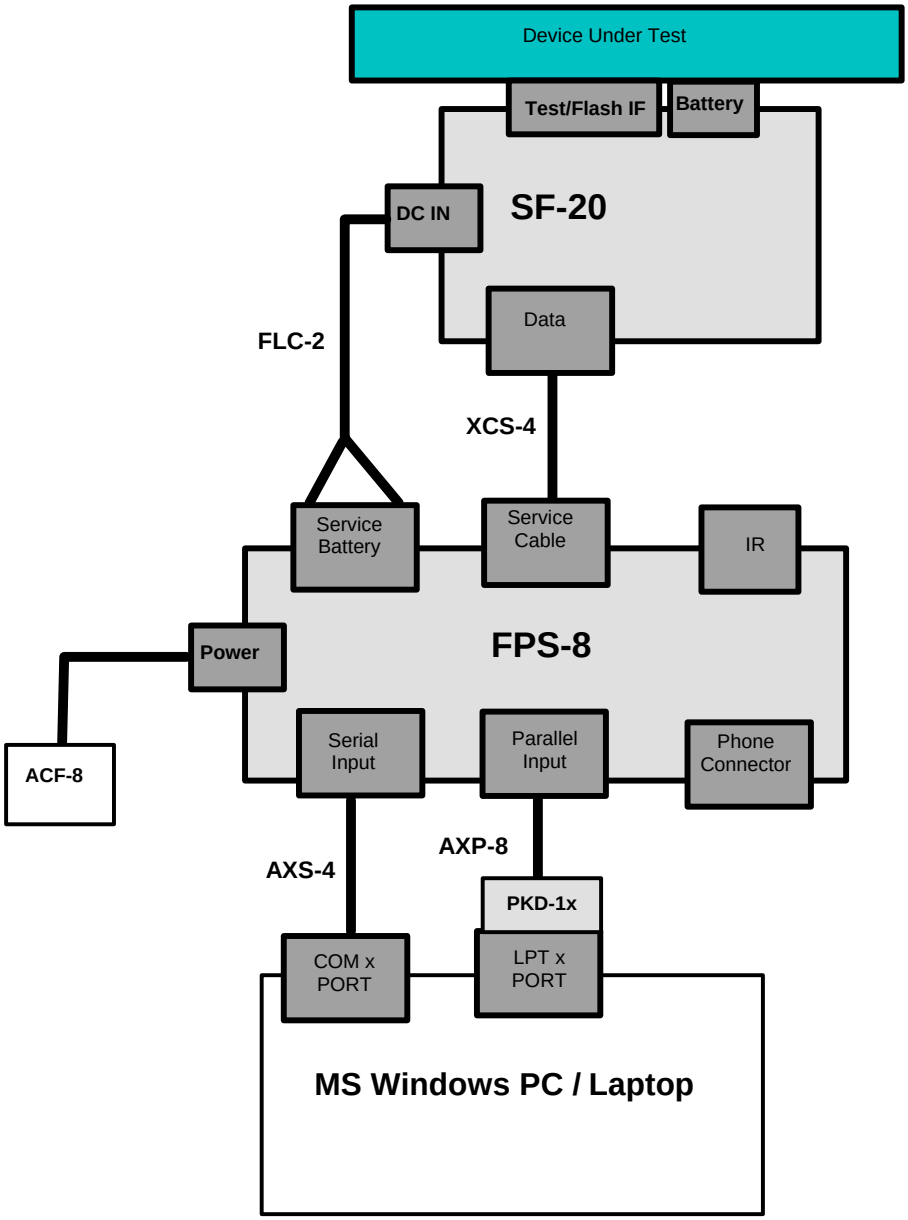
FPS-8 / SF-20 software update setup



Item	Type designation	Code	Description
1	FPS-8	0080321	Flash Prommer sales pack includes:ACF-8 power supply, AXS-4 service cable and AXP-8 Bi-directional parallel cable.
2	SF-20	0770702	POS flash adapter
3	FLC-2	0730185	Power supply cable
4	AXS-4	0730090	Serial data cable 2x 9 pole Sub-D (Part of 0080321)
5	ACF-8	0680032	Power Supply (Part of 0080321)
6	AXP-8	0730298	Parallel printer cable (Part of 0080321)
7	XCS-4	0730178	Data cable

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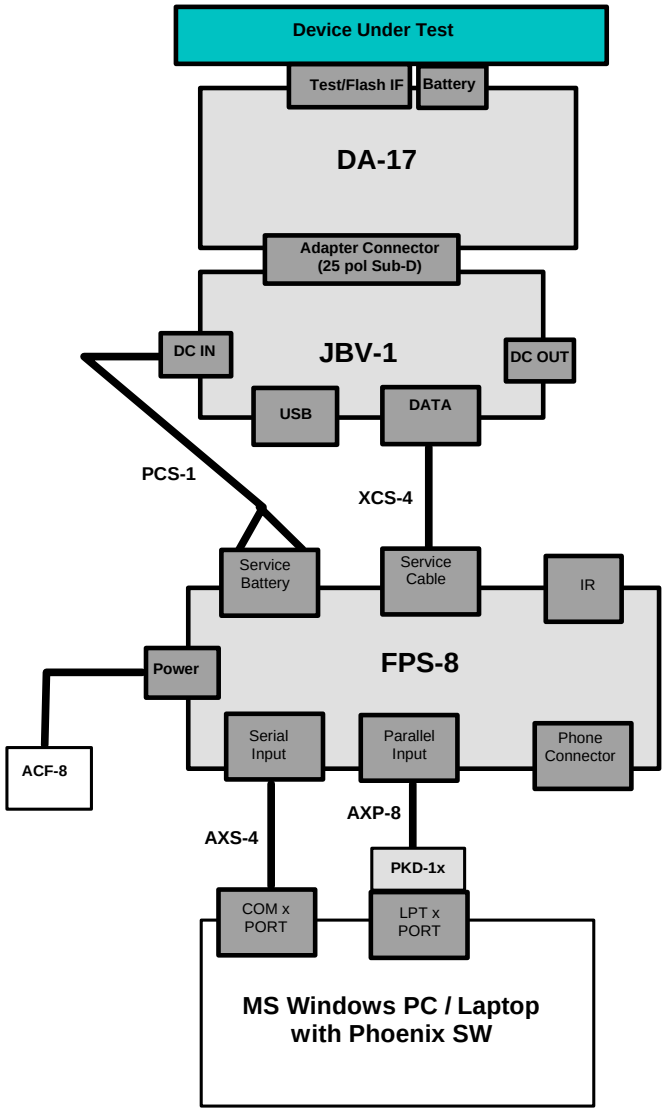
DA-17 software update setup

The usage of DA-17 for flashing under specific circumstances is possible. Note that the phone is in "normal" mode after powered on.



Item	Type designation	Code	Description
1	FPS-8	0080321	Flash Prommer sales pack includes: ACF-8 power supply, AXS-4 service cable and AXP-8 Bi-directional parallel cable.
2	JBV-1	0770298	Docking station for testing & flashing
3	DA-17	0770701	Docking station adapter
4	PCS-1	0730012	Power cable
5	AXS-4	0730090	Serial data cable 2x 9 pole Sub-D (Part of 0080321)
6	ACF-8	0680032	Power Supply (Part of 0080321)
7	AXP-8	0730298	Parallel printer cable (Part of 0080321)
8	XCS-4	0730178	Data cable

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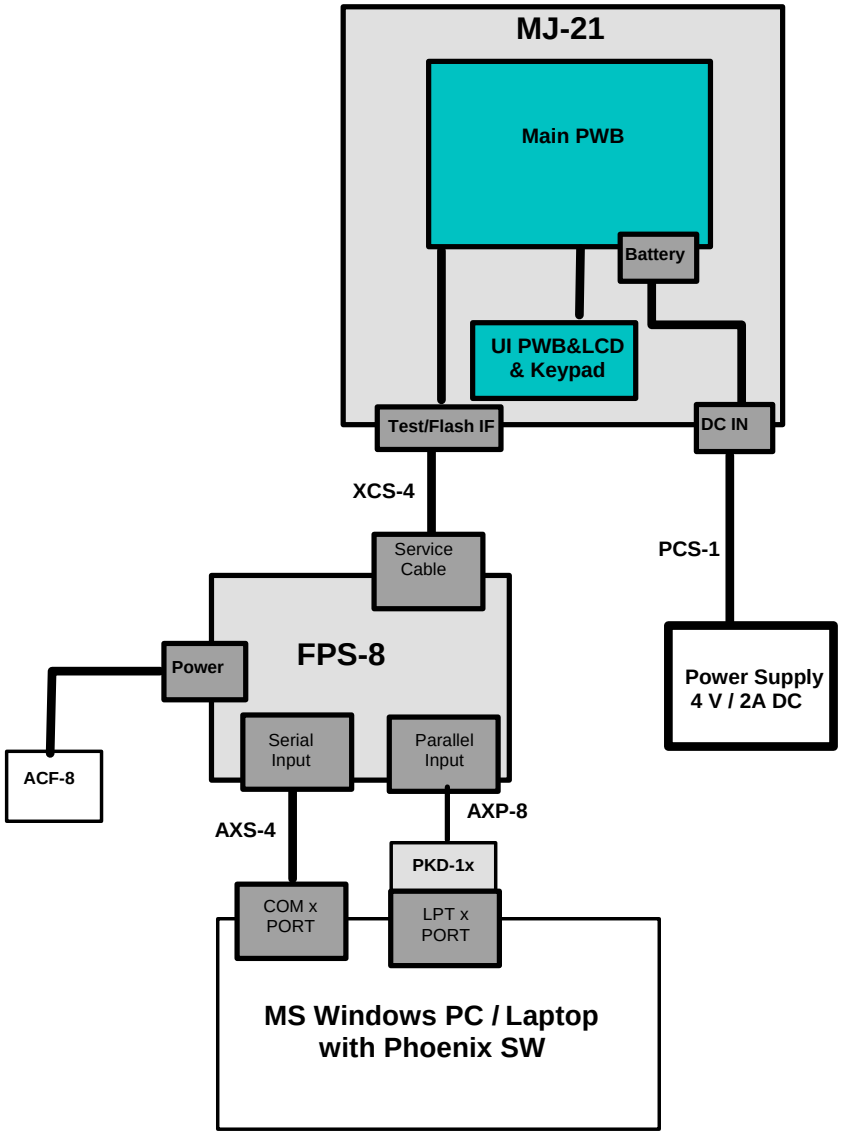
MJ-21 software update setup

Module repair jig flashing is possible with the following setup. Usually additional equipment is connected for further repair activities.



Item	Type designation	Code	Description
1	FPS-8	0080321	Flash Prommer sales pack includes: ACF-8 power supply, AXS-4 service cable and AXP-8 Bi-directional parallel cable.
2	MJ-21	0770298	Module repair jig
4	PCS-1	0730012	Power cable
5	AXS-4	0730090	Serial data cable 2x 9 pole Sub-D (Part of 0080321)
6	ACF-8	0680032	Power Supply (Part of 0080321)
7	AXP-8	0730298	Parallel printer cable (Part of 0080321)
8	XCS-4	0730178	Data cable

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Connecting FPS-8 to PC

To establish a connection between your PC and FPS-8:

1 Connect FPS-8 to the PC as shown in the diagrams above (no phone is needed at this step)

2 Start Phoenix.

3 From the File menu, choose Manage Connections.

4 Click Add.

5 Select Manual.

6 Select FPS-8.

7 Select the port where you have connected the serial cable of FPS-8.

8 In COMBOX_DEF_MEDIA, select FBUS.

9 Click Finish.

10 Click Arrow up key until FPS8 COM1 FBUS becomes the first on the list.

11 Click Apply and close the window.

The connection between the PC and FPS-8 is configured.

Activating FPS-8

Follow the instructions inside the FPS-8 sales package to activate FPS-8.

Checking application software version inside FPS-8

When you have established a connection to FPS-8 and it has been activated, the first thing to do is to check that you have the correct application software version inside the FPS-8. Phoenix software can check this automatically. The procedure goes as follows:

1 Go to a partner web site and download the latest AMS FPS-8 software.

To check the application software version:

2 Click FPS-8 downloads.

3 Click Flash Update.

4 Click AMS/Production version.

5 Click the latest version (xx . xx . xxx)

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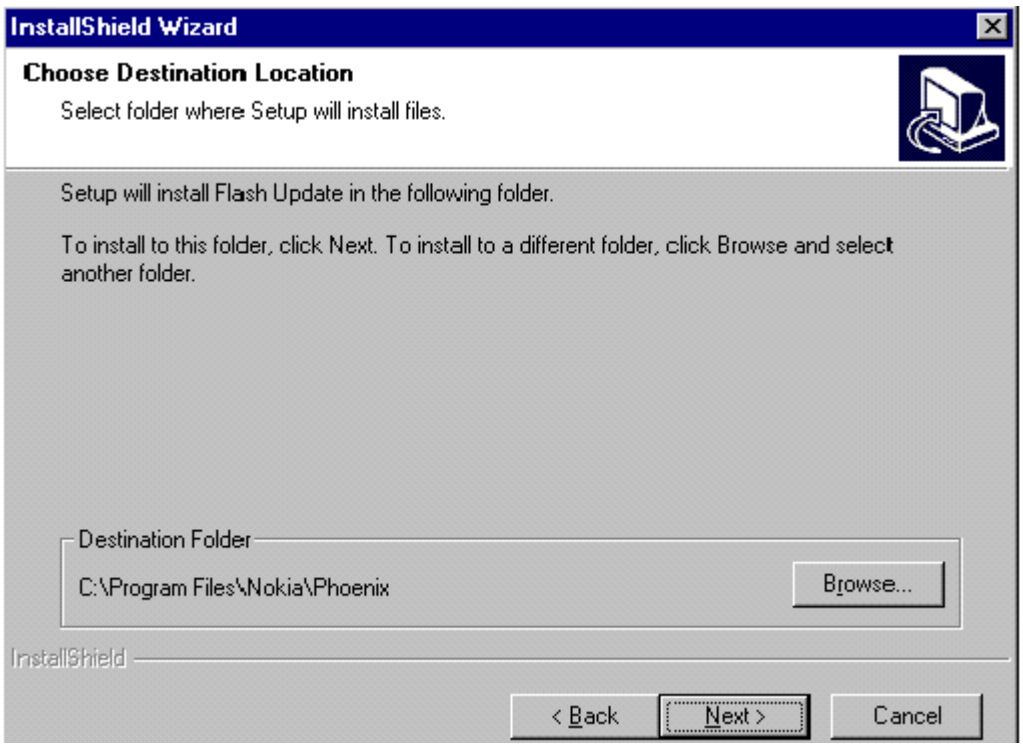
6 Save the file **flash_update_xx_xx_xxx.exe** to your hard drive to a place which you can remember.

7 Go to that directory and double-click **flash_update_xx_xx_xxx.exe.**

You see the following note on your screen. Install files to the directory which installation the program suggests you.

Figure 1: Install Shield Wizard screen


InstallShield Wizard
Choose Destination Location
Select folder where Setup will install files.
Setup will install Flash Update in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\Program Files\Nokia\Phoenix
Browse...
InstallShield
< Back
Next >
Cancel

When the installation has been finished, FPS-8 files are located in that directory.

You can now start Phoenix software.

When Phoenix software has started, do the following:

1 From the Flashing menu, choose FPS-8/FPS-8C Maintenance.

2 If software inside the FPS-8 prommer is too old, you will get the following notification:

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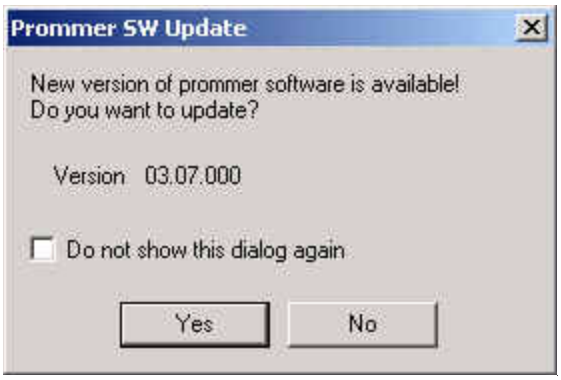
Figure 2: Prommer software update screen



3 Click Yes**.**

On the small screen you see as the prommer goes to the service mode (mode2 is lit).

Application software, secondary boot codes and algorithm codes are updated.

Your PC and FPS-8 are now ready for the RH-47 software update.

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RE-Flashing Procedure

Flashing with FPS-8

First ensure that all cables are connected according to one of the diagrams above (depending on the case)! See the respective chapter about connecting FPS-8 to a PC.

To flash the phone:

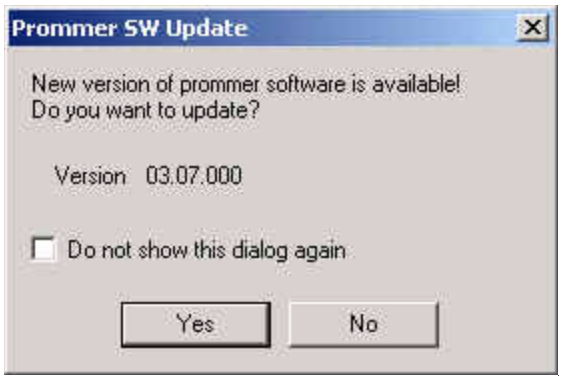
1 Start Phoenix.

Ensure that the latest AMS version of Phoenix is installed (Help -> About Phoenix).

If a newer version is available you must install it (see Updating Phoenix).

2 From the Flashing menu, choose FPS-8 Maintenance.

If the firmware in FPS-8 is old, you will get the following message:



3 Click Yes and wait until the prommer is updated.

Now you are ready to flash the phone.

4 Remove the SIM card and MMC card from the phone.

5 Turn the phone ON.

6 To scan the phone, press Ctrl + R (Make sure that the phone is loaded: the phone type as well as the software version should be displayed in the status bar):

If no product is found, then choose RH-47 manually: File -> Open Product -> RH-47.

7 From the Flashing menu, choose FPS-8 Flash.

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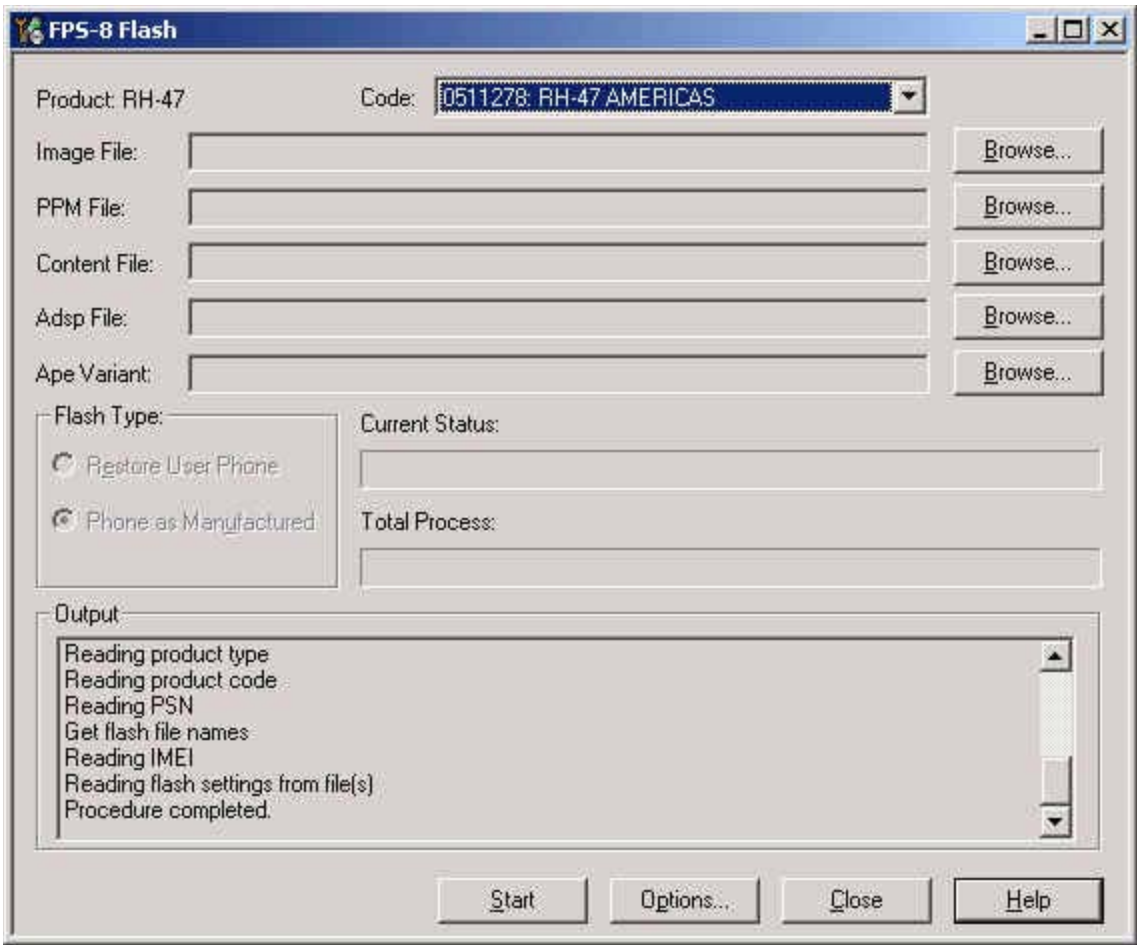
The following window appears:



Ensure that there is a data package installed: in this case the MCU, PPM and content package files are displayed automatically in the respective fields. Otherwise install a data package file (see related chapter).

8 In the Options window, check the "Force full factoryset after flashing" check

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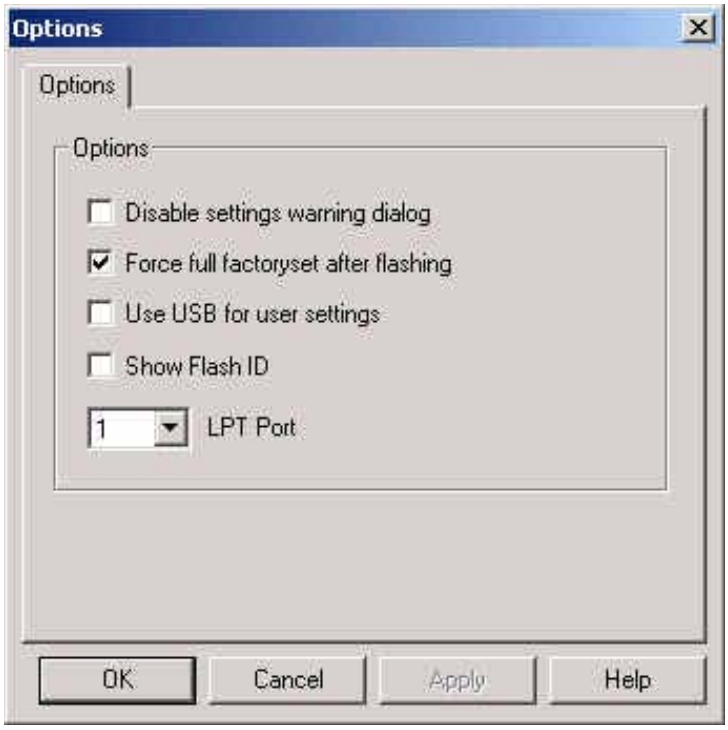
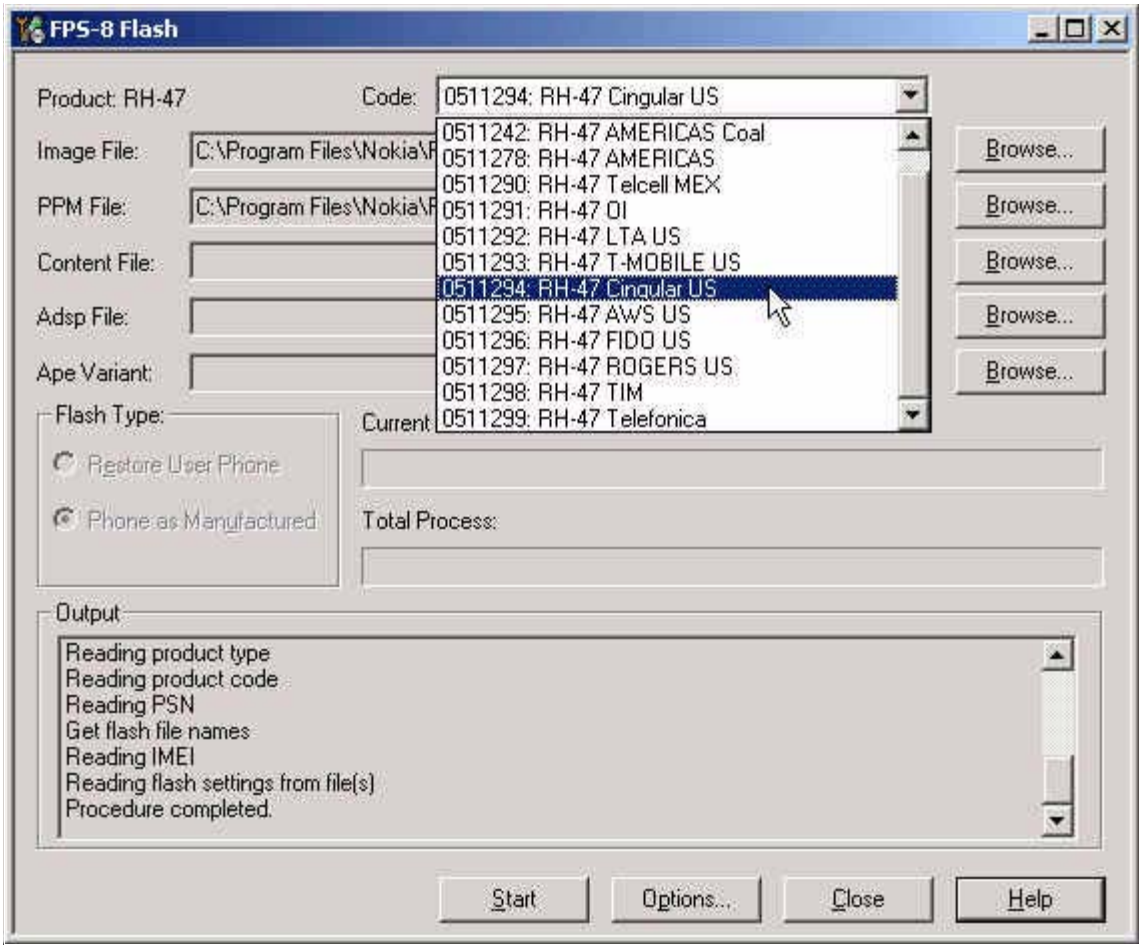
box:_





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(A) In case a data package is installed:
From the Product Code drop-down menu, choose the software variant you want to flash.

Click Start.

(B) In case no data package is installed:

Click Browse.

Choose manually the desired MCU, PPM and Content Package files.

Click Start.

If an error message appears at the end of the flash process:

"Turn the power on and select OK"

Disconnect the phone completely.

Connect the phone again.

Press the power button of the phone and wait about 15 seconds.

Click OK.

If the phone does not turn on, then the MCU software version does not match the phone's HW and software update is not possible.

After the phone is successfully flashed, the user memory area should be formatted.

9 From the Product menu, choose User Data Area Format.

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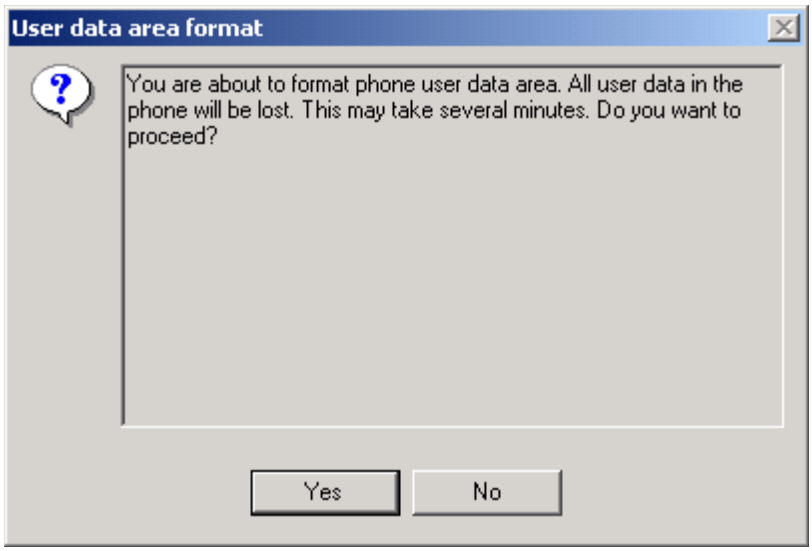
The following window appears:


User data area format
You are about to format phone user data area. All user data in the phone will be lost. This may take several minutes. Do you want to proceed?
Yes
No

10 Click Yes and wait until you get a confirmation that the user area is successfully formatted.

Flashing with FLS-4S

Make sure that you have the latest FLS-4S driver installed (in Windows: Settings -> Control: Panel -> FLS virtual port).

The flashing process is the same as with FPS-8:

1 Connect all cables of FLS-4S as shown in the diagrams presented in section POS setup with FLS-4S adapter (use either a parallel port or USB).

2 Disconnect FPS-8 completely from the PC.

3 From the Flashing menu, choose FLS-4S Flash.

Repeat the steps presented in the previous section (FPS-8 flashing).

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Installing Data Package

A product data package contains all product specific data to make the Phoenix service SW and tools usable with a certain phone model.

It also includes the latest version of flash update package for FLS-4S and FPS-8.

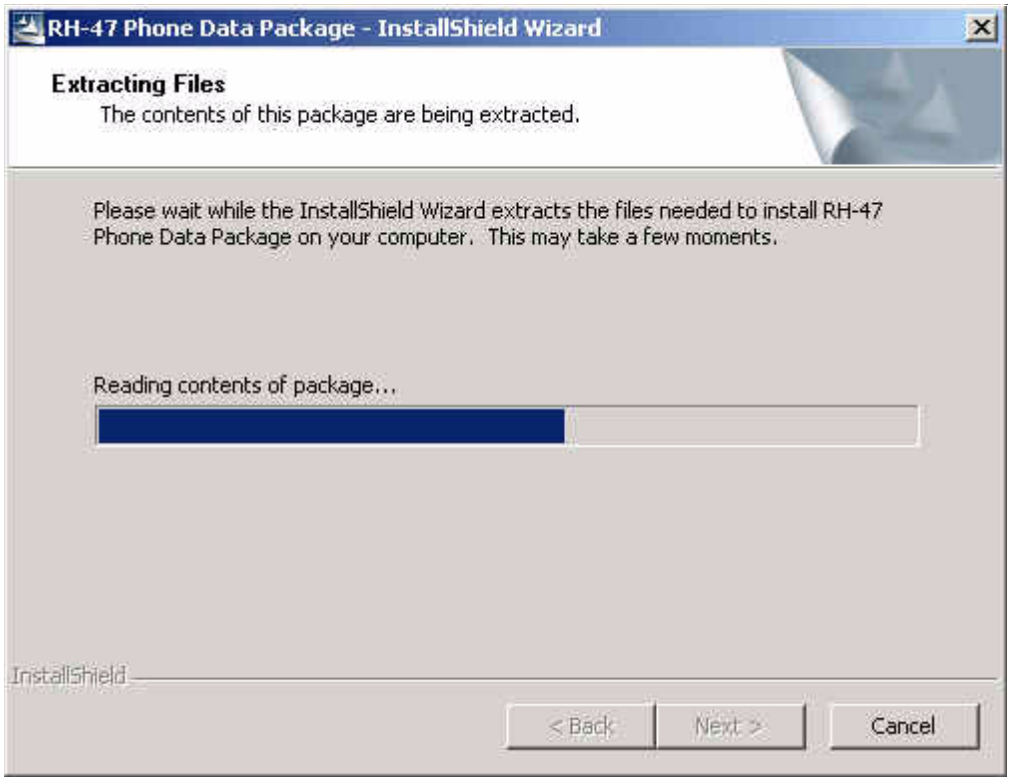
Before installation:

- Check that the dongle is attached to the parallel port of your computer.
- Find out whether there is a data package installed in Windows: Settings -> Control Panel-> Add Remove programs.
- If the current data package is old, please remove it. Then download the latest data package for **RH-47** e.g. **RH-47_dp_v_x_xx_MCUSWx_xx.exe.**
- Close all other programs.

To start installation:

1 Double-click the installation file (e.g. **RH-47_dp_v_x_xx_MCUSWx_xx.exe**).

The following window appears:


RH-47 Phone Data Package - InstallShield Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield Wizard extracts the files needed to install RH-47 Phone Data Package on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

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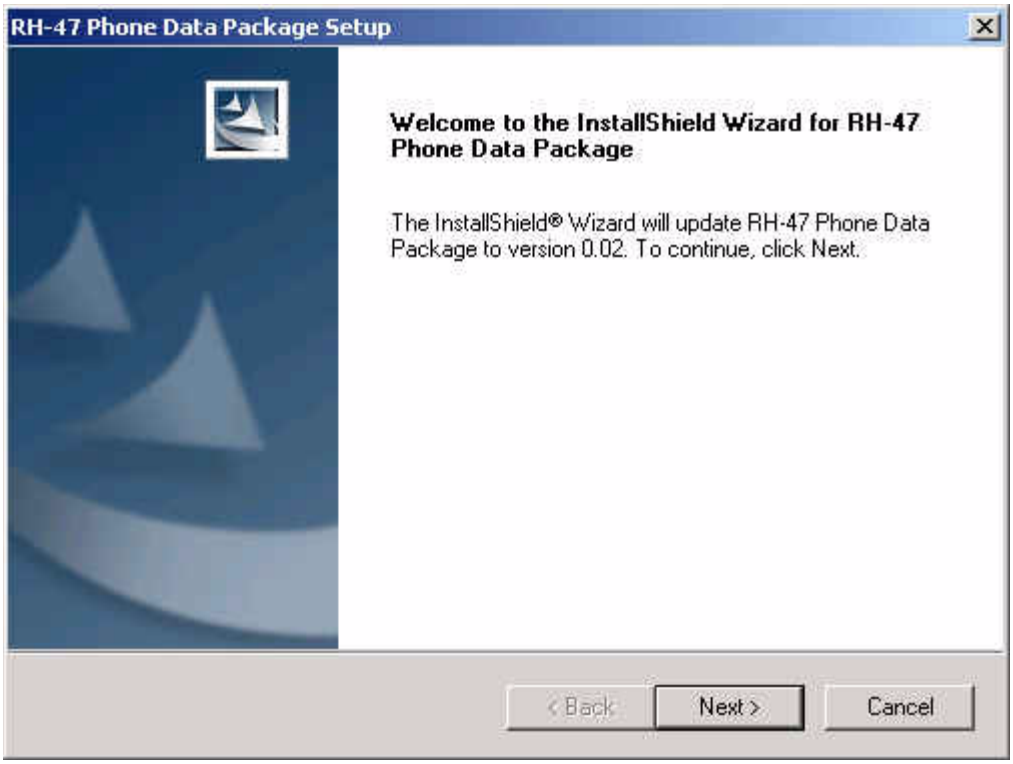
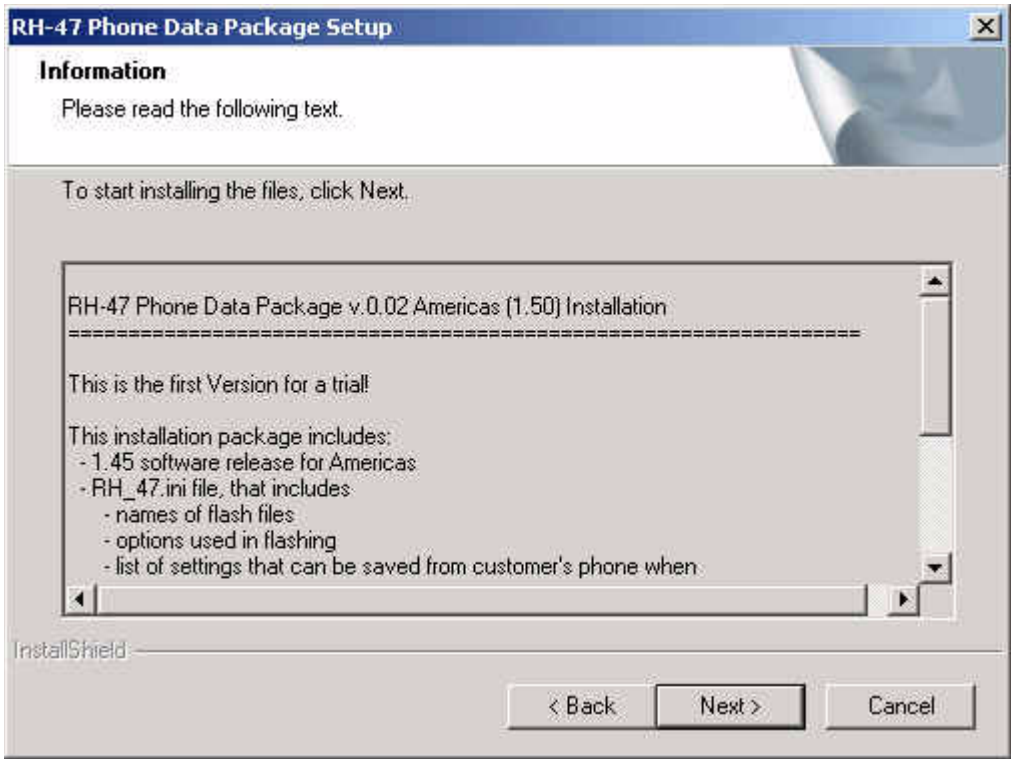
2 To continue, click Next:


RH-47 Phone Data Package Setup
Welcome to the InstallShield Wizard for RH-47 Phone Data Package
The InstallShield® Wizard will update RH-47 Phone Data Package to version 0.02. To continue, click Next.
< Back
Next >
Cancel

3 In the RH-47 Phone Data Package Setup window, you can see the contents of the data package. Read this text carefully (there is information about the Phoenix version needed with this package) and click Next:


RH-47 Phone Data Package Setup
Information
Please read the following text.
To start installing the files, click Next.
RH-47 Phone Data Package v.0.02 Americas (1.50) Installation
This is the first Version for a trial!
This installation package includes:
- 1.45 software release for Americas
- RH_47.ini file, that includes
- names of flash files
- options used in flashing
- list of settings that can be saved from customer's phone when
InstallShield
< Back
Next >
Cancel

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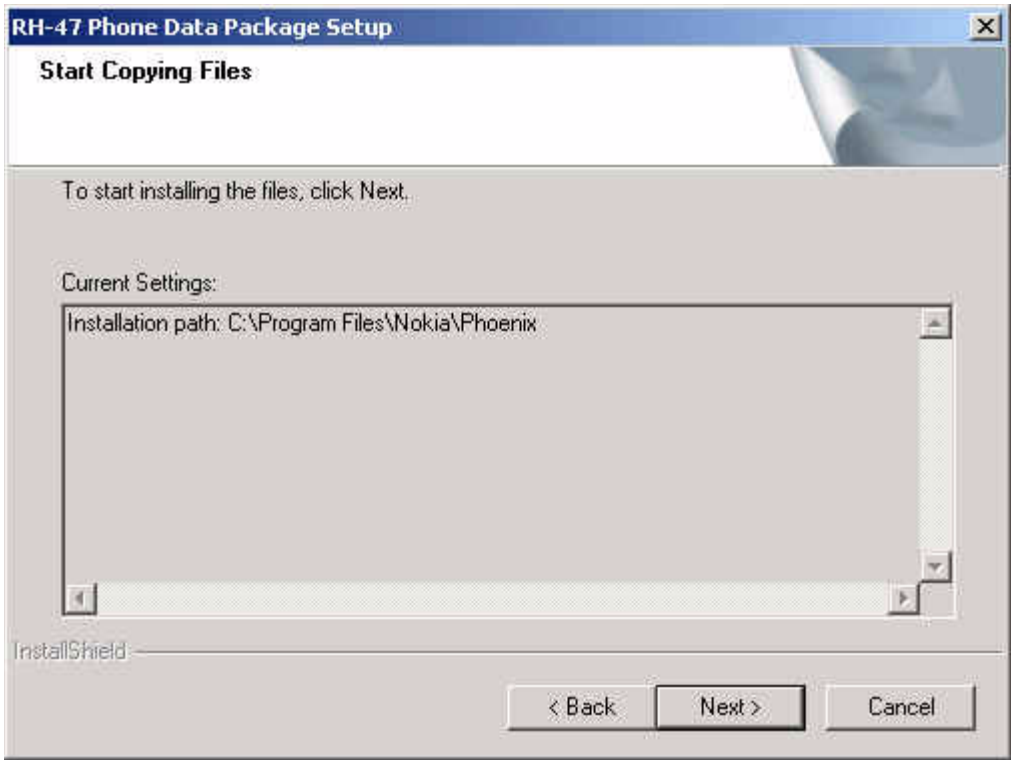
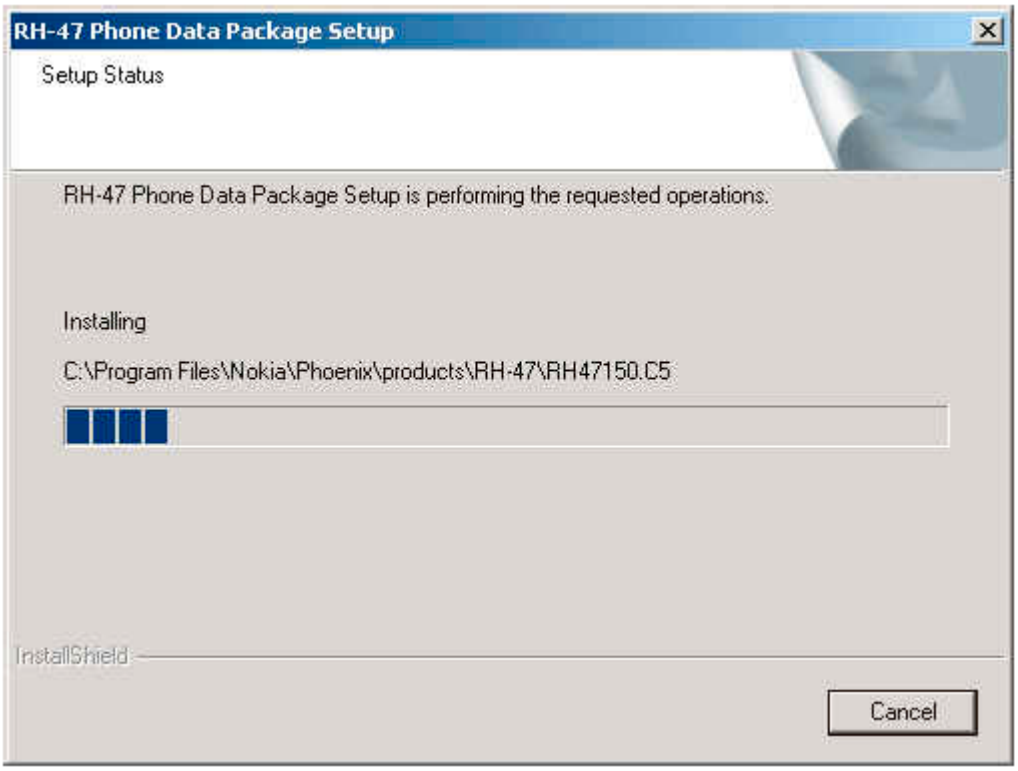
4 Confirm location and click Next to continue:



Phone model specific files are installed. Please wait.



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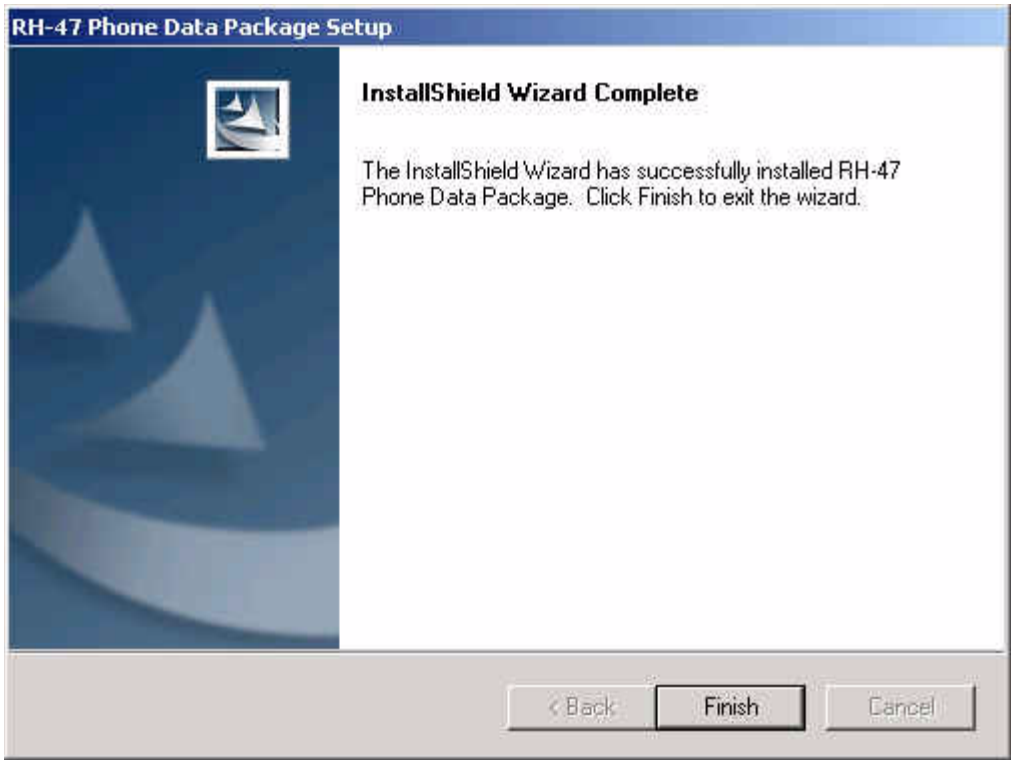
5 To complete installation, click Finish.


RH-47 Phone Data Package Setup
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed RH-47 Phone Data Package. Click Finish to exit the wizard.
< Back
Finish
Cancel

You now have all phone model specific files installed on your PC.

Uninstalling data package

You can uninstall the data package manually from Windows: *Control Panel-> Add/ Remove Programs/RH-47 Phone data package.*

If you try to install the same version of the data package that you already have, you are asked if you want to uninstall the current version. Click OK to uninstall and Cancel if you do not want to uninstall.

If you try to install a version that is newer than the currently installed one, there is no need for uninstalling.

Uninstall RH-47 Phone Data Package
Do you want to completely remove the RH-47 Phone Data Package application and all of its components?
OK
Cancel

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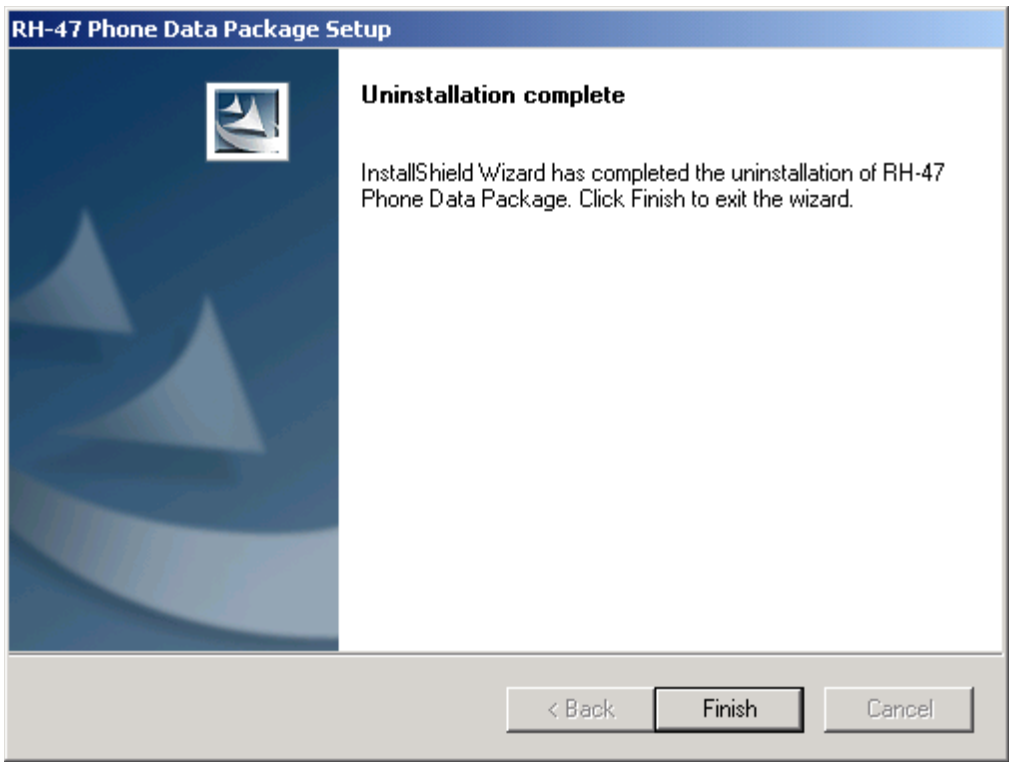
The uninstallation progress is shown. In the end the following window appears:


RH-47 Phone Data Package Setup
Uninstallation complete
InstallShield Wizard has completed the uninstallation of RH-47 Phone Data Package. Click Finish to exit the wizard.
< Back
Finish
Cancel

To complete uninstallation, click Finish.

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Phoenix Self Tests

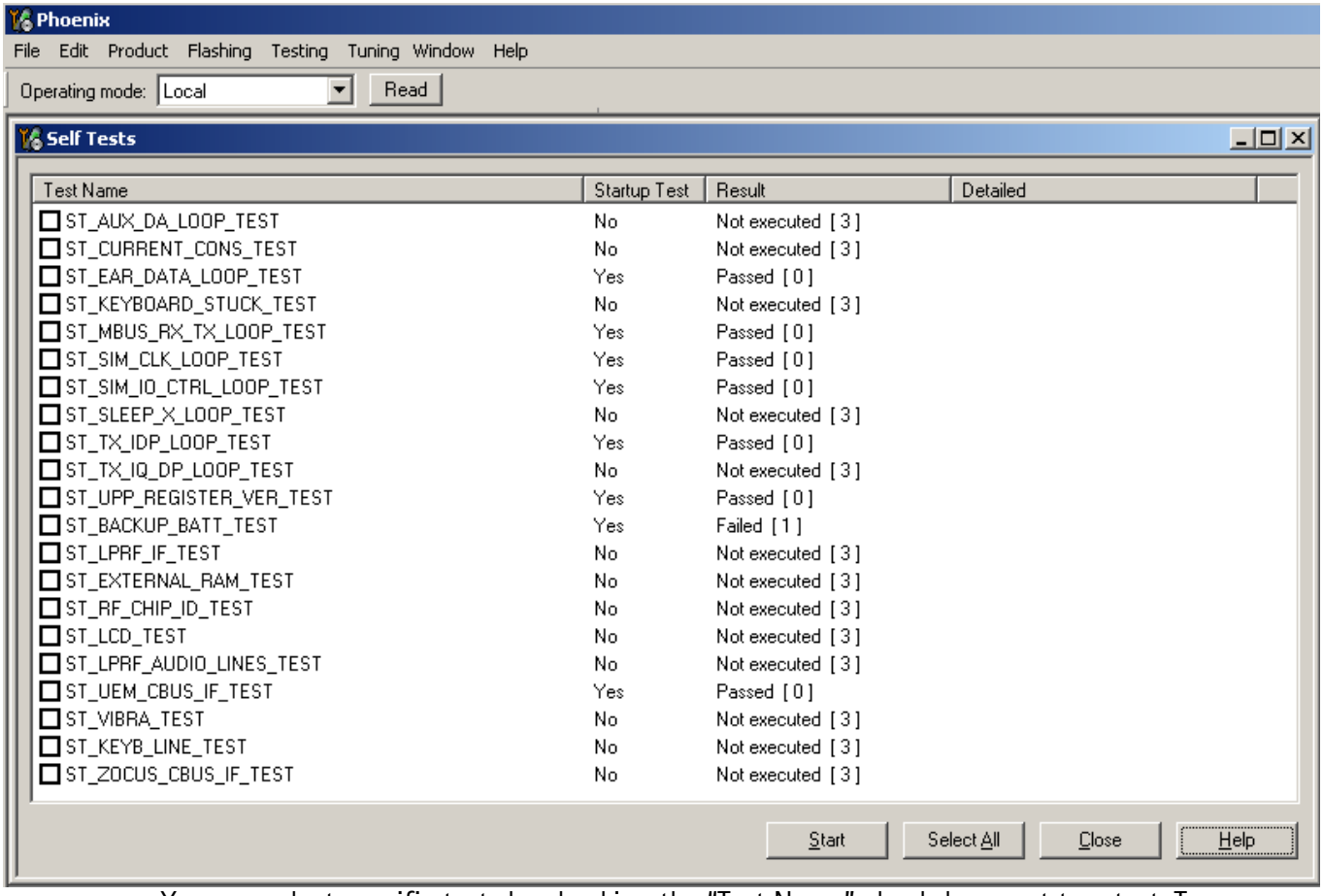
Self tests are divided into two categories:

- Startup self-test
- Triggered/called self-test

The startup procedure performs a self-test and the results are stored at every startup / switch on of the phone. When the Phoenix menu is opened, the stored results from the last startup are displayed.

The tests already performed are marked with "Yes" in the "Startup Test" column.

Figure 3: Phoenix Self Tests window


Phoenix
File Edit Product Flashing Testing Tuning Window Help
Operating mode: Local
Read
Self Tests
Test Name | Startup Test | Result | Detailed
ST_AUX_DA_LOOP_TEST | No | Not executed [3]
ST_CURRENT_CONS_TEST | No | Not executed [3]
ST_EAR_DATA_LOOP_TEST | Yes | Passed [0]
ST_KEYBOARD_STUCK_TEST | No | Not executed [3]
ST_MBUS_RX_TX_LOOP_TEST | Yes | Passed [0]
ST_SIM_CLK_LOOP_TEST | Yes | Passed [0]
ST_SIM_IO_CTRL_LOOP_TEST | Yes | Passed [0]
ST_SLEEP_X_LOOP_TEST | No | Not executed [3]
ST_TX_IDP_LOOP_TEST | Yes | Passed [0]
ST_TX_IQ_DP_LOOP_TEST | No | Not executed [3]
ST_UPP_REGISTER_VER_TEST | Yes | Passed [0]
ST_BACKUP_BATT_TEST | Yes | Failed [1]
ST_LPRF_IF_TEST | No | Not executed [3]
ST_EXTERNAL_RAM_TEST | No | Not executed [3]
ST_RF_CHIP_ID_TEST | No | Not executed [3]
ST_LCD_TEST | No | Not executed [3]
ST_LPRF_AUDIO_LINES_TEST | No | Not executed [3]
ST_UEM_CBUS_IF_TEST | Yes | Passed [0]
ST_VIBRA_TEST | No | Not executed [3]
ST_KEYB_LINE_TEST | No | Not executed [3]
ST_ZOCUS_CBUS_IF_TEST | No | Not executed [3]
Start
Select All
Close
Help

You can select specific tests by checking the "Test Name" check-box next to a test. To start the test(s) you selected, click the "Start" button.

Alternatively, you can perform all tests by clicking the "Select All" button. For all tests, RH-47 should be in the "Local" operating mode.

Note: For RH-47, the following two tests can only performed as a single test:

- ST_EXTERNAL_RAM_TEST
- ST_LCD_TEST

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The tests will get a "Timeout" or "Failed" status, if selected and performed at the same time with other tests.

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Phoenix Tuning

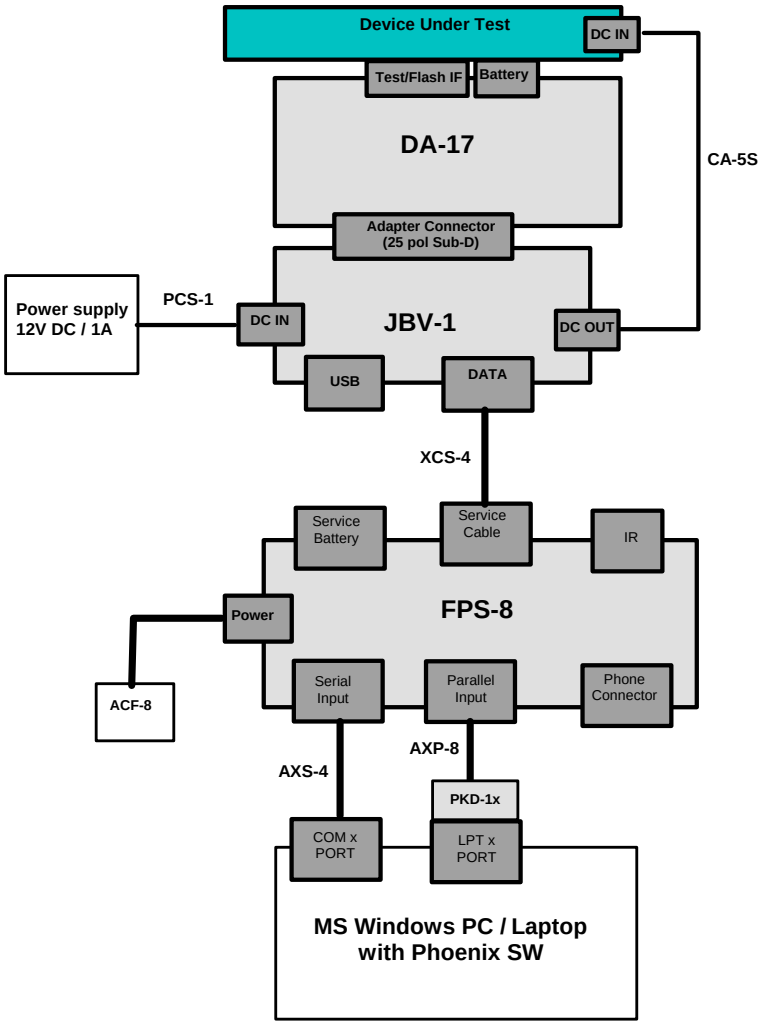
Energy management calibration

Energy Management calibration is a baseband tuning operation.

EM calibration should be carried out in a JBV-1 docking station equipped with a DA-17 docking station adapter.

Power to the JBV-1 should be supplied from an external power supply, not from the FPS-8 prommer!

Connect the **RH-47** phone as shown in the following diagram:



Item	Type designation	Code	Description
1	DA-17	0770701	Docking Station adapter for JBV-1
2	JBV-1	0770298	Flash/Test docking station with generic data & power interfaces.

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3	PCS-1	0730012	Power cable to connect e.g. JBV-1 to FPS-8.2 x Banana connectors to 5,5 mm DC plug
4	XCS-4	0730178	Modular cable for e.g. connection between FPS-8 and SF-20.
5	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
6	AXS-4	0730090	Data cable 2x 9 pole Sub-D male/female (Part of 0080321)
7	AXP-8	0730298	Bi-directional parallel data cable (Part of 0080321)
8	ACF-8	0680032	Power Supply (Part of 0080321)

Before proceeding, make sure that you have a working connection between FPS-8 and the PC as described in the respective chapter.

To start Energy Management Calibration:

1 Start Phoenix.

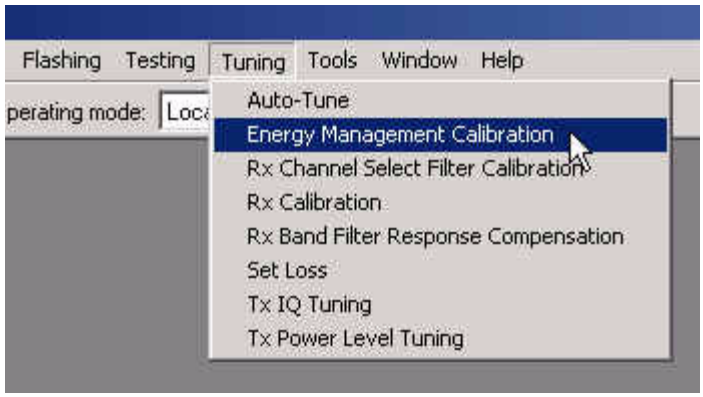
2 Supply voltage in the range **11–15 V** from an external power supply to DC IN of JBV-1.

3 The phone starts up in local mode automatically.

4 To scan the phone, press Ctrl+R.

Make sure that the phone is successfully loaded: you should see "SW version, date, RH-47" in the Phoenix status bar.

5 From the Tuning menu, choose Energy Management Calibration.



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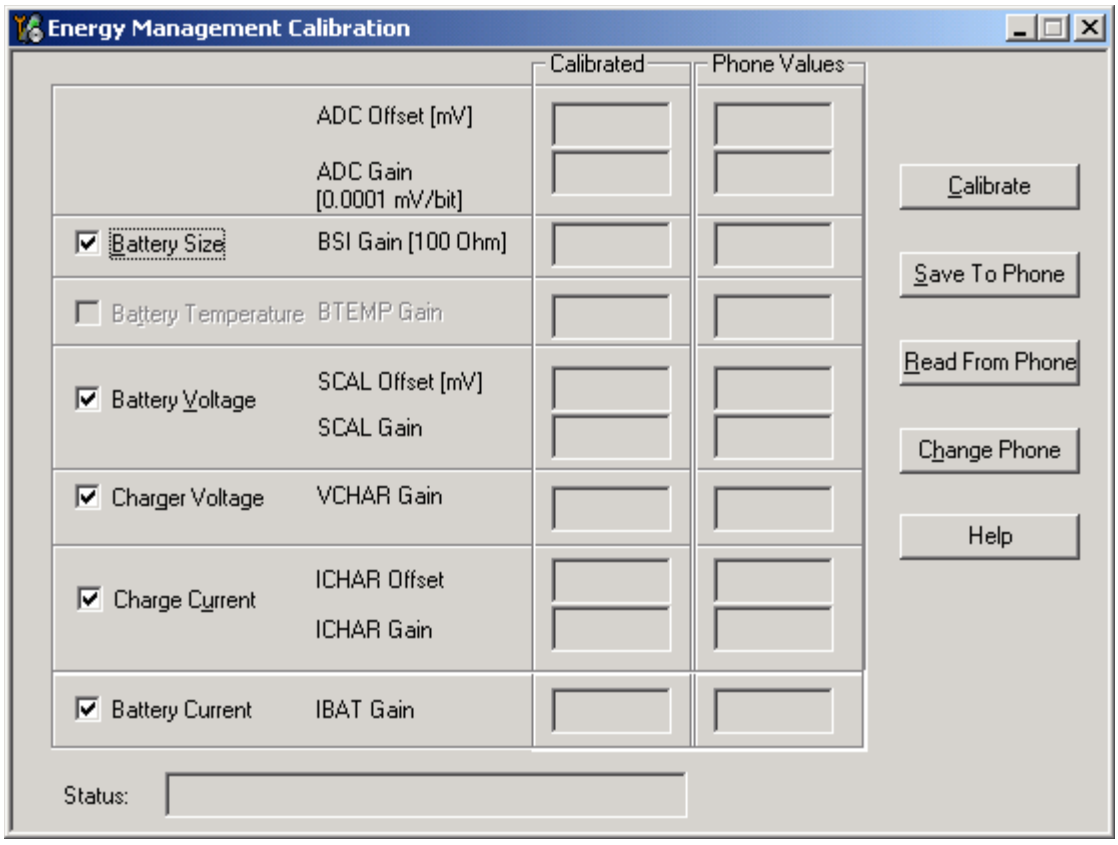
The following window appears:



6 To show the current values in the phone memory and to check that communication with the phone works, click Read From Phone.

7 Check all calibrations (Battery Size, Battery Voltage etc.).

8 Click Calibrate and wait until Calibrated appears in the status line.

9 If values are within limits, click "Save To Phone" to save the calibrated values.

Values written to phone appear in the status line.

Note! Only the values of the checked tunings are saved!

10 To verify that the new values are saved, click Read From Phone.

11 To end the tuning process, close the Energy Management Calibration dialog.

12 After exiting the Energy Management Calibration dialog, you must manually switch the phone ON.

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Rx/Tx Tuning

One of the following setups is needed to perform tunings in Phoenix, depending on the case and available equipment. Testing equipment can either be a single RX/TX testsystem or two separate RX/TX test systems by using a RF coupler.

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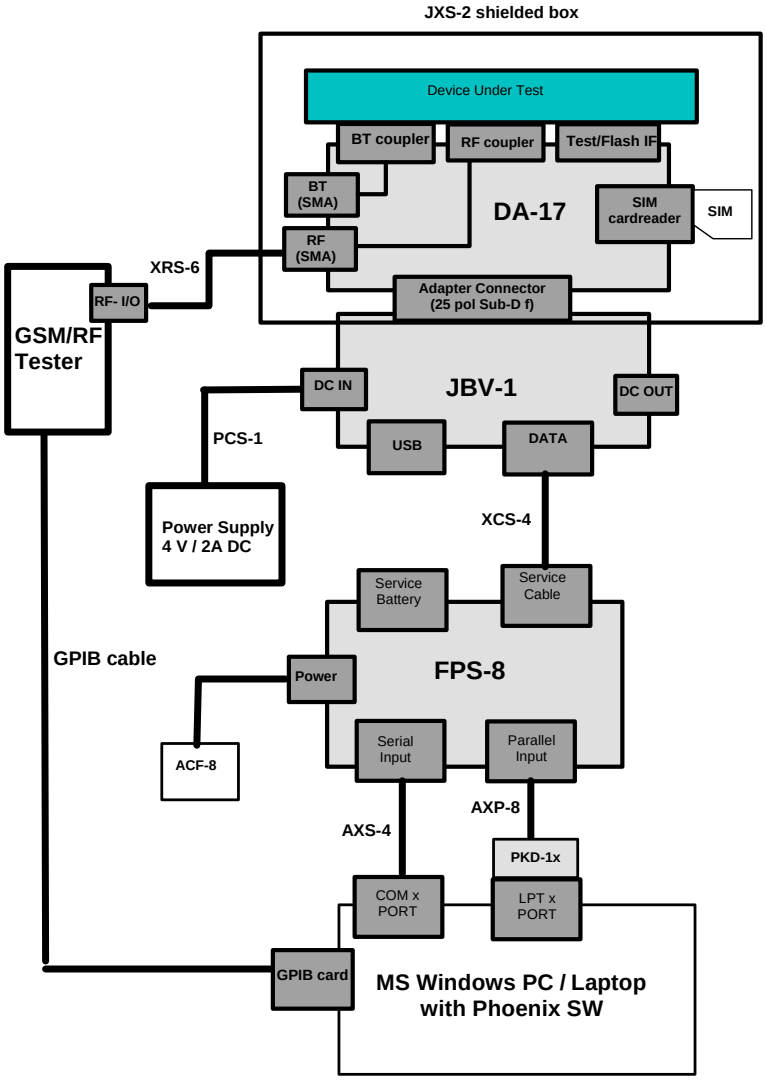
RF tuning setup DA-17



Item	Type designation	Code	Description
1	DA-17	0770701	Docking Station adapter for JBV-1
2	JBV-1	0770298	Flash/Test docking station with generic data & power interfaces.
3	PCS-1	0730012	Power cable to connect e.g. JBV-1 to power supply.2 x Banana connectors to 5,5 mm DC plug
4	XCS-4	0730178	Modular cable for e.g. connection between FPS-8 and SF-20.
5	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
6	AXS-4	0730090	Serial cable 9 pole Sub-D - part of FPS-8 sales package!
7	AXP-8	0730298	Parallel bi-directional printer cable - part of FPS-8 sales package!
8	ACF-8	0680032	Power Supply – part of FPS-8 sales package!

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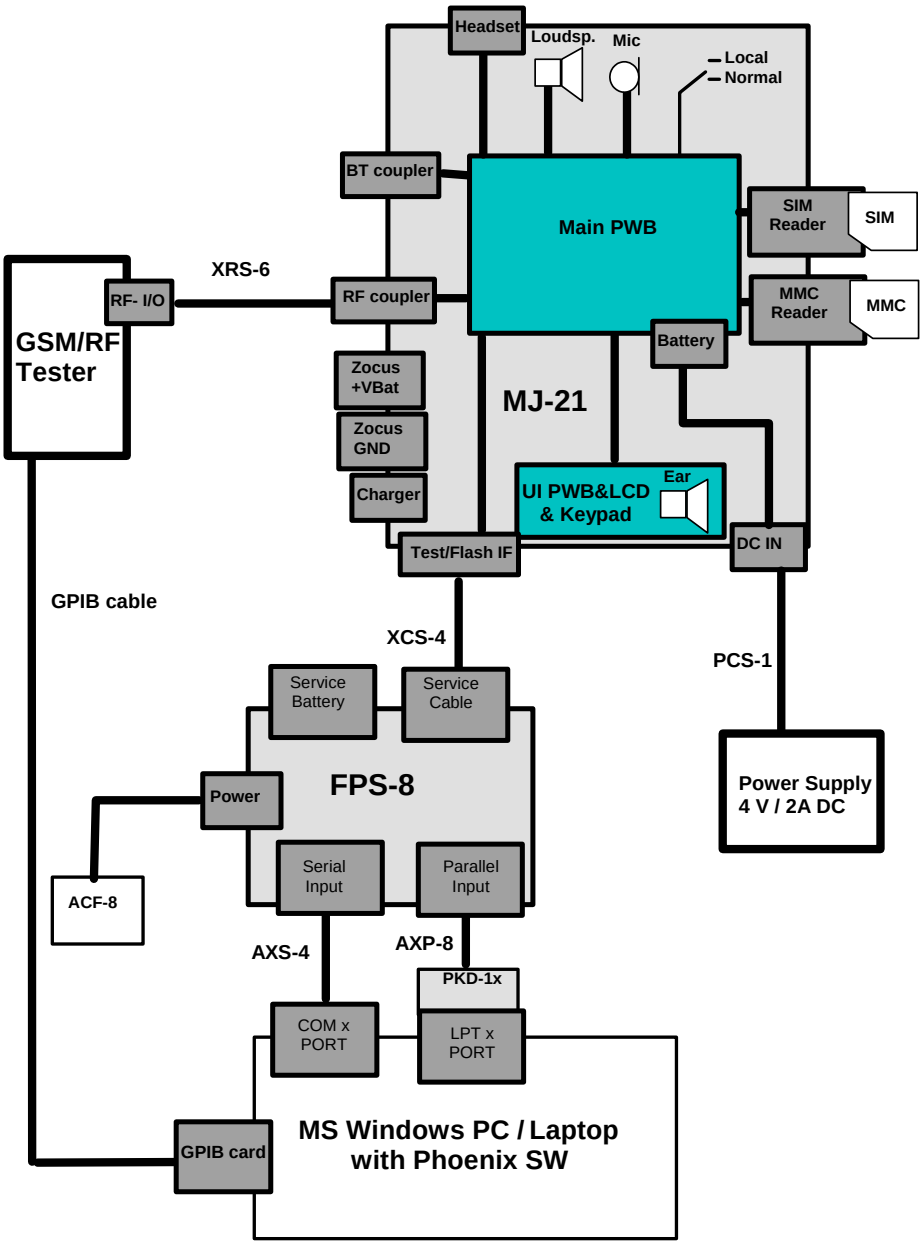
MJ-21 tuning setup



Item	Type designation	Code	Description
1	MJ-21	0770646	Module repair jig
2	XCS-4	0730178	Modular cable for e.g. connection between FPS-8 and SF-20.
3	PCS-1	0730012	Power cable to connect e.g. JBV-1 to FPS-8.2 x Banana connectors to 5,5 mm DC plug
4	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
5	AXS-4	0730090	Serial cable 9 pole Sub-D - part of FPS-8 sales package!

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6	AXP-8	0730298	Parallel bi-directional printer cable - part of FPS-8 sales package!
7	ACF-8	0680032	Power Supply – part of FPS-8 sales package.

Start tuning with Phoenix:

1 Connect the phone to a PC running Phoenix service software with one of the set-ups described.

2 Start Phoenix service software and open an FBUS connection: From the File menu, choose Scan Product.

Wait until phone information is shown in the lower right corner of the screen.

RF tuning after repairs

Different repairs require different tunings. In general, it is necessary to determine in which section the repair was done to select which tunings to perform. To determine if an RF tuning is necessary after a repair, it is important that the functionality of the repaired circuit is understood well. It is recommended to perform a complete RF tuning, if RF is repaired.

- In general repairs, the TX part requires "TX Power Level Tuning" and "TX IQ Tuning".
- In general repairs, the RX part or PLL part always require "RX Calibration", “Rx Band Filter Response Calibration”.
- If Mjoelner is changed, all calibrations have to be done.

Other parts interfacing to TX, RX or PLL might require tuning, but common sense should be used. For example, if a component that has no influence on the RF performance has been changed, such as the microphone, on/off key, mechanical parts or similar, there is no need to do any RF tunings.

Below is a list of needed activities related to changed component:

Exchanged Component	IMEI re-writing	EM calibration	RF tuning
D190 - UEM	YES	NO	NO
D311 - Flash 1	YES	YES	YES
D312 - Flash 2	NO	NO	NO
D310 - SDRAM	NO	NO	NO
D100 - UPP	NO	NO	NO
N601 - RF ASIC	NO	NO	YES
N801 - RF PA	NO	NO	YES
N430 - BT MCM	NO	NO	NO

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Rx channel select filter calibration

This procedure calibrates the baseband filter inside Mjoelner. It is done by internally measuring a prototype filter. For this reason the calibration is done once, not separately in all three bands. No signal must be fed from an external signal generator.

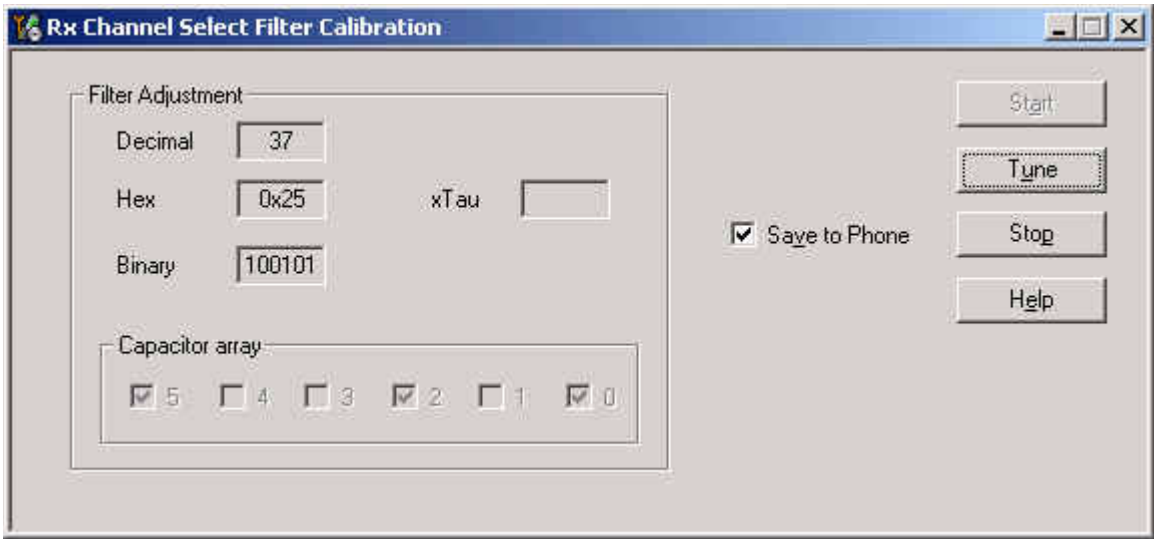
To start the calibration:

1 Launch Phoenix.

2 Set the phone in local mode.

3 From the Tuning menu, choose Rx Channel Select Filter Calibration.

The following window appears. If you do not want to save the newly calibrated values in the phone, uncheck the "Save to Phone" check box (e.g. for testing purposes) before proceeding:



4 Click Start and then the Tune button.

The optimal values for GSM 850 are found.

5 To complete tuning, click Stop.

RX calibration (incl. VCXO-calibration)

Rx calibration is used to determine gain at different gain-settings for front-end and Mjoelner and needs to be done in both bands (GSM 850 and GSM 1900). A signal generator is needed!

Calibration is automatically performed first at GSM850 and then at the GSM1900 band. If tuning is successful, tuning continues at the next band. Calibration must be done separately on each band.

RX calibration in GSM850 combines two tunings: VCXO calibration and AGC calibration.

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The calibration of the GSM1900 band only determines AGC values.

Remember to take jig and cable attenuations into account when entering the power levels.

The **VCXO-calibration** finds out a calibration values for VCXO, an AFC initial value and AFC slope coefficients.

A value (RF_TEMP), which represents the RF hardware temperature, is determined during RX calibration. This temperature value is used by DSP to RSSI reporting in the normal mode of the phone. It is not visible in the calibration process. Note that calibration must be done between 22°..36°

AGC-calibration

The AGC-calibration finds the gain values of the RX-gain system. The AGC consists of RF LNA, which can be either on or off (gain difference between on and off state is nominally 30 dB) and BB gain, which can be controlled, in 6 dB steps. This gives 15 gain steps RSSI0 to RSSI14. LNA is off for steps RSSI0 to RSSi4.

AFC-calibration measures the gain at gain step RSSI4 and RSSI7. The other gain values are calculated.

VCXO-calibration

The VCXO-calibration ensures the function of an initial synchronization (before location update), when the mobile station is in normal mode. For an error free initial synchronization, the 26 MHz frequency of the VCXO must be accurate enough. Therefore, a VCXO cal value is written into the RefOSCCAL register of the Mjoelner.

During VCXO-calibration, the VCXO cal value is changed by a DSP-algorithm until synchronization is possible. This means that the VCXO oscillates at 26 MHz with a sufficient minimum frequency error.

To further minimize the frequency error, an initial AFC-value is determined by the DSP and written into RefOSCAFC register of the Mjoelner.

Also the DSP algorithm determines 3 AFC slope coefficients Slope C1.3 during VCXO calibration.

One AFC slope value is not sufficient for Mjoelner, because the AFC slope is non-linear in this chip.

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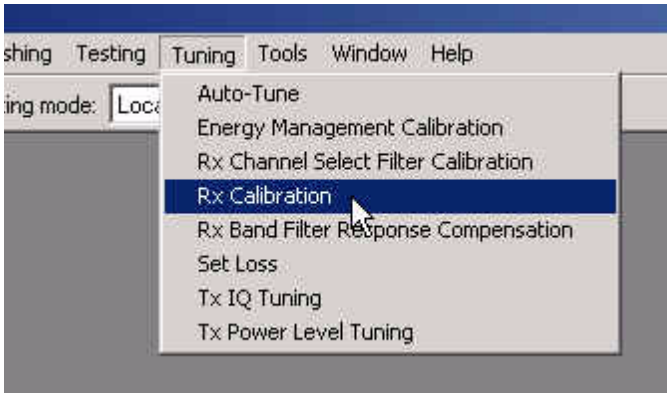
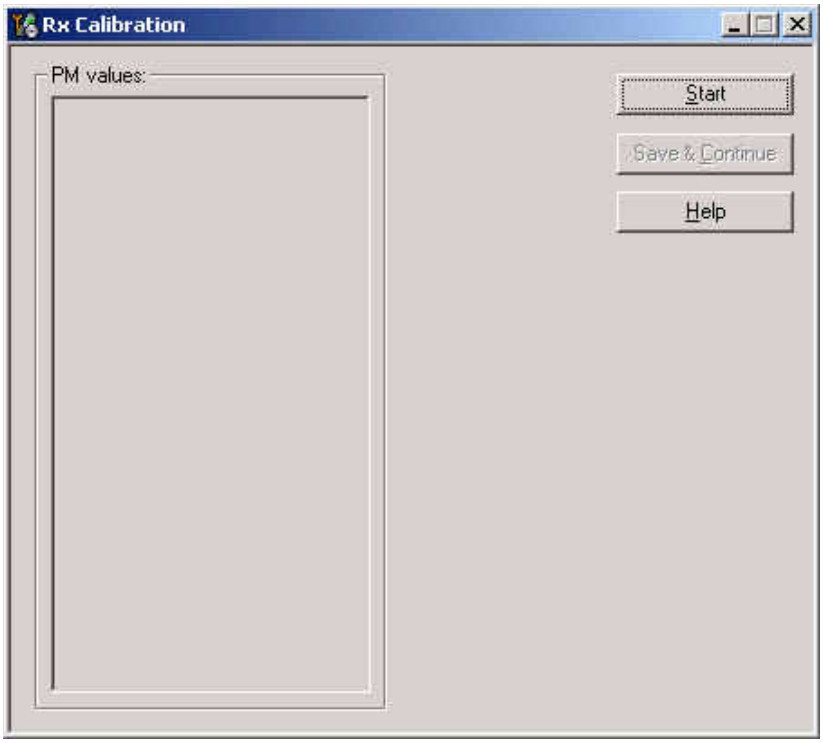
To start the tuning process:

1 From the Tuning menu, choose Rx Calibration.



The following window appears.



2 To start tuning, click Start.

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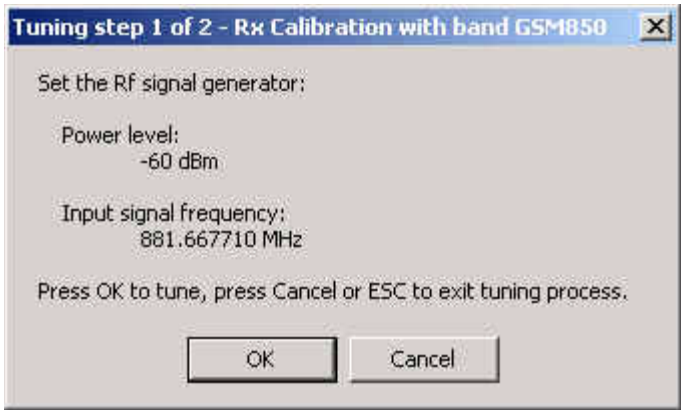
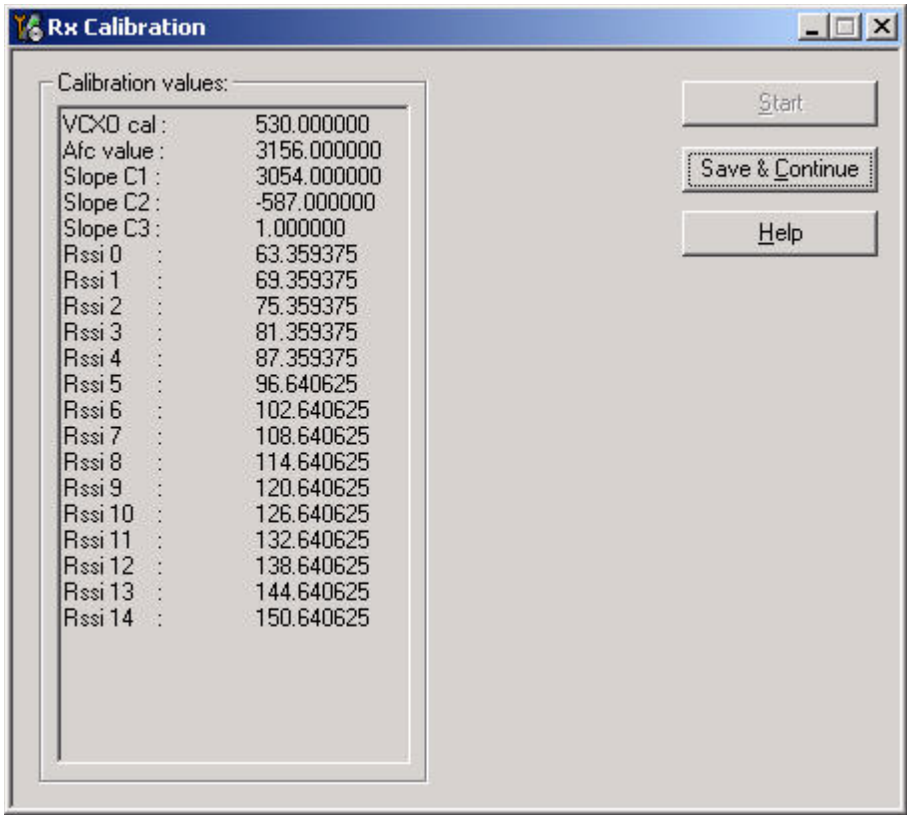
3 Set the Rf signal generator to the required **GSM850** frequency and click OK:


Tuning step 1 of 2 - Rx Calibration with band GSM850
Set the Rf signal generator:
Power level:
-60 dBm
Input signal frequency:
881.667710 MHz
Press OK to tune, press Cancel or ESC to exit tuning process.
OK
Cancel

Tuning values and ADC reading are shown. A typical result looks like this:



4 To proceed to **GSM1900,** click Save & Continue.

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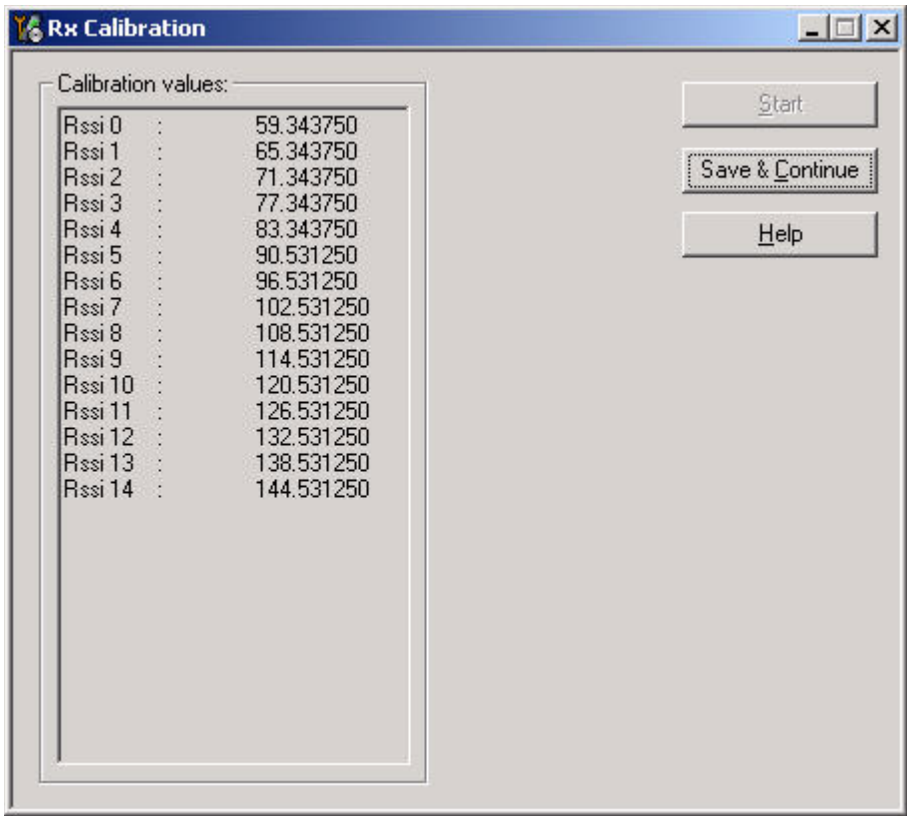
5 Set the Rf signal generator to the required **GSM1900** frequency and click OK:

Tuning step 2 of 2 - Rx Calibration with band GSM1900
Set the Rf signal generator:
Power level:
-60 dBm
Input signal frequency:
1960.067710 MHz
Press OK to tune, press Cancel or ESC to exit tuning process.
OK
Cancel

Tuning values and ADC readings are shown. A typical result looks like this:



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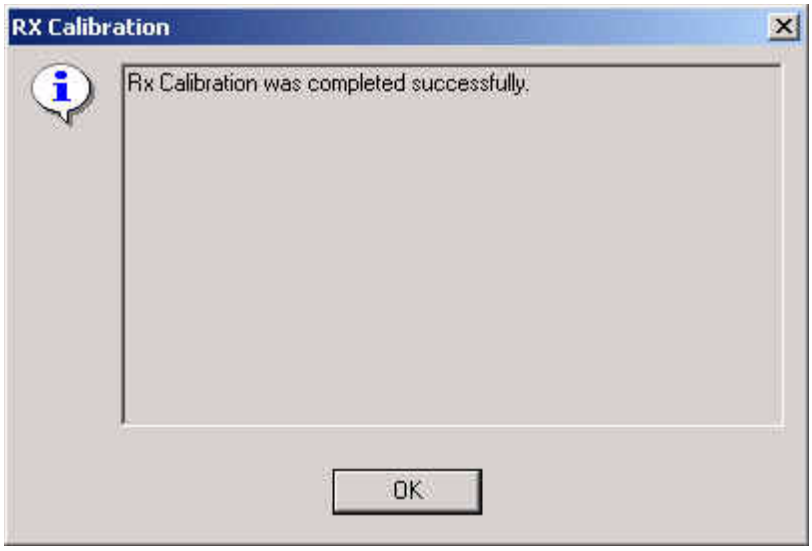
6 Click "Save & Continue" and the following window appears:



7 To finish the tuning process, click OK.

RX AGC limits

The Rx calibration is only valid if it is within certain limits.

For the most recent limits, see RH-47 Production Testing Requirements.

If calibration is not within limits, there is a fault in the RX chain.

Below are the values for RSSI4 and RSSI7:

RSSI 4:

band	min	typ	max
GSM 850	81	86	91
GSM 1900	79	85	89

RSSI7:

band	min	typ	max
GSM 850	103	108	113
GSM 1900	100	104	110

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Rx band filter response compensation

Calibration is done automatically, starting with GSM850 and then continuing with GSM1900.

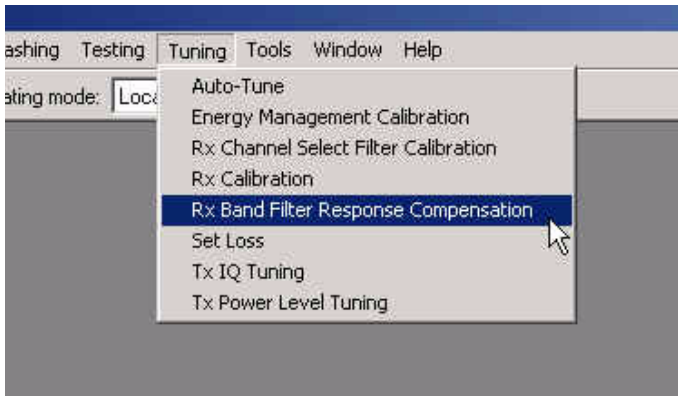
Connect the phone according to the setup diagrams.

Note! Remember to perform "Rx calibration" before doing "Rx band filter response compensation"!

Remember to take jig and cable attenuations into account!

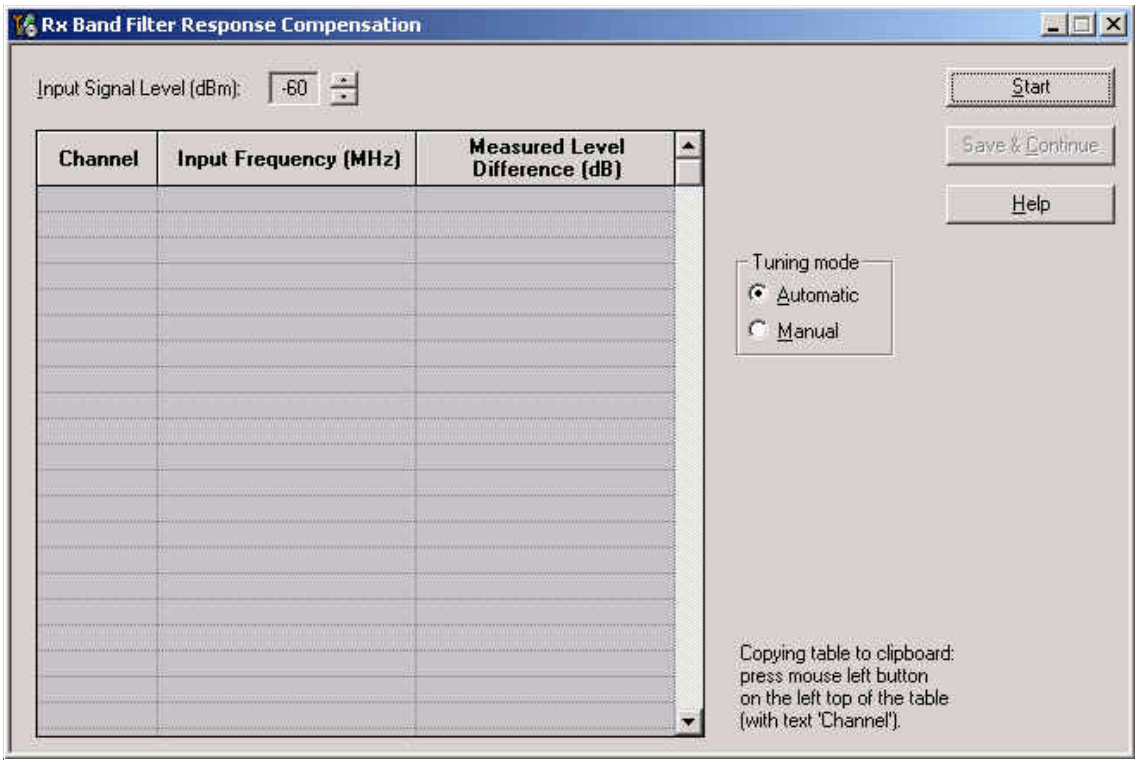
To start calibration:

1 From the Tuning menu, choose Rx Band Filter Response Compensation.



2 In the Tuning mode pane, select the **Manual** tuning mode button.

3 To start the tuning process, click Start.



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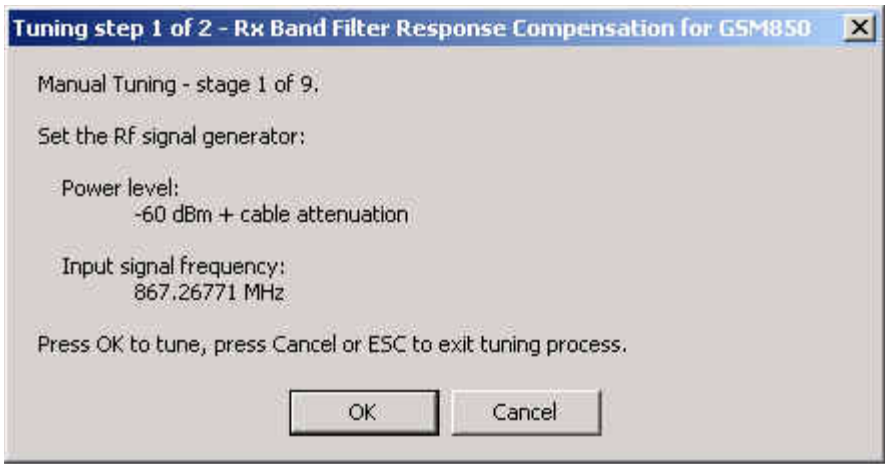
4 Supply 9 different frequencies to the phone.

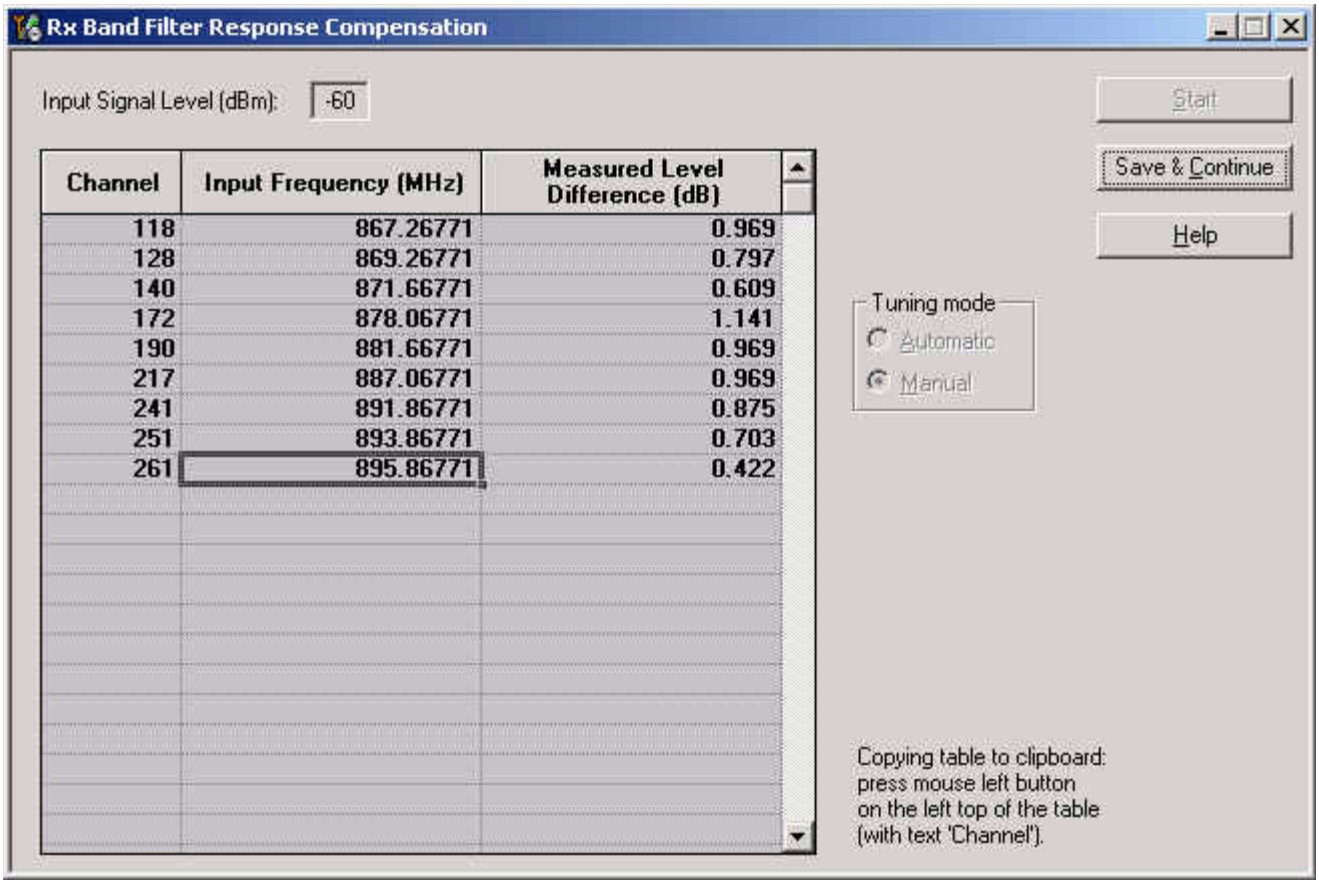
The tuning starts at the GSM850 band and continues the same way for the GSM1900 band.

5 Set the first required **frequency and power level**. Click OK:


Tuning step 1 of 2 - Rx Band Filter Response Compensation for GSM850
Manual Tuning - stage 1 of 9.
Set the Rf signal generator:
Power level:
-60 dBm + cable attenuation
Input signal frequency:
867.26771 MHz
Press OK to tune, press Cancel or ESC to exit tuning process.
OK
Cancel

6 Repeat the sequence **9 times**, until all channels are done.

In the end, you should see the following window:



7 To proceed to the GSM 1900 band, click Save & Continue.

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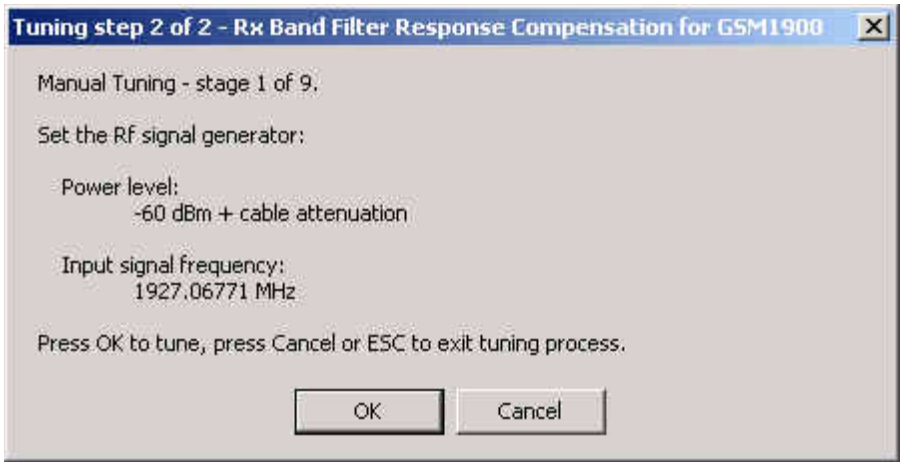
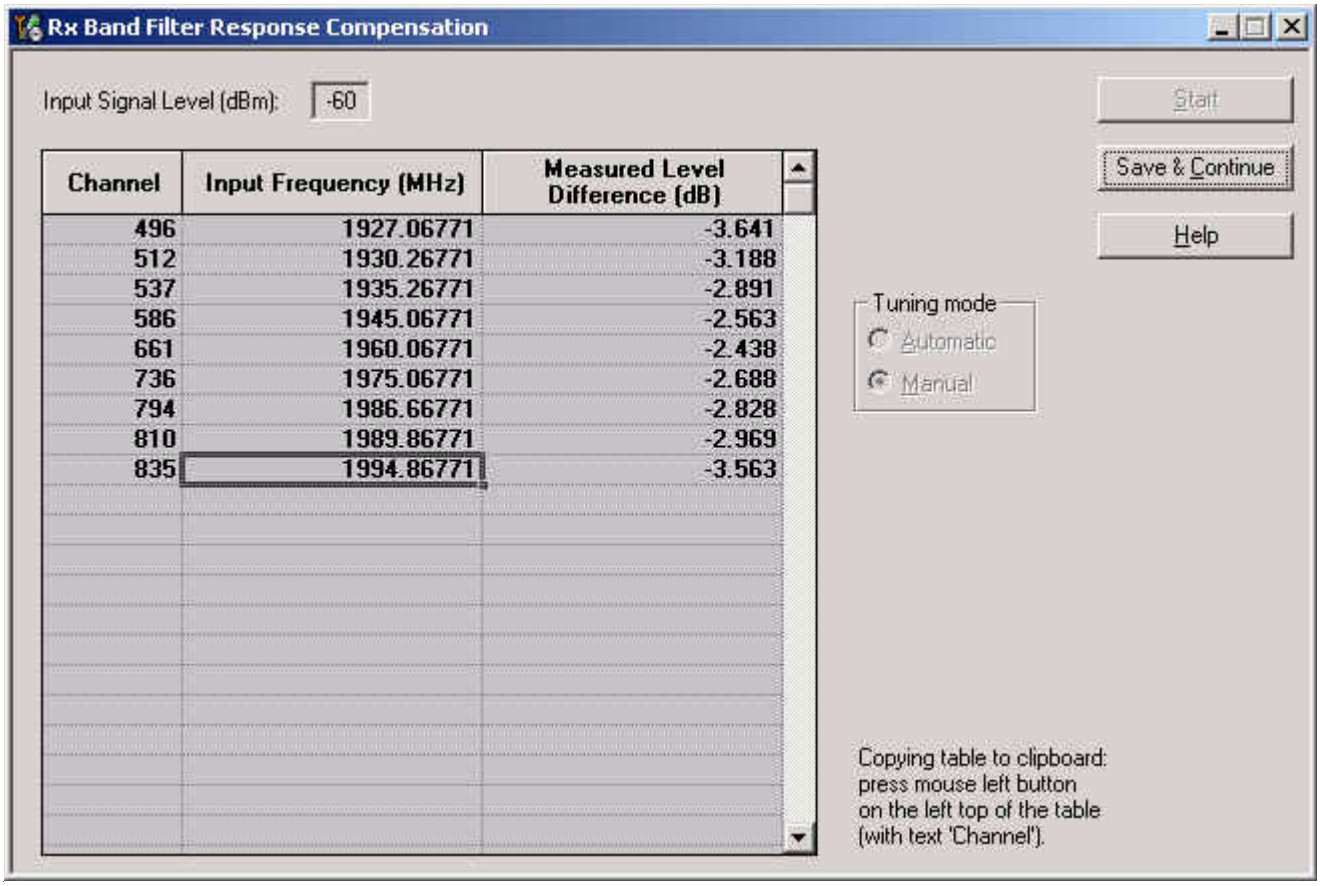
8 Set the first required **frequency and power level** and click OK:


Tuning step 2 of 2 - Rx Band Filter Response Compensation for GSM1900
Manual Tuning - stage 1 of 9.
Set the Rf signal generator:
Power level:
-60 dBm + cable attenuation
Input signal frequency:
1927.06771 MHz
Press OK to tune, press Cancel or ESC to exit tuning process.
OK
Cancel

9 Repeat the sequence **9 times**, until all channels are done.

In the end, you should see the following window:



10 To finish the Rx Band Filter Response Compensation, click Save & Continue.

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TX I/Q tuning

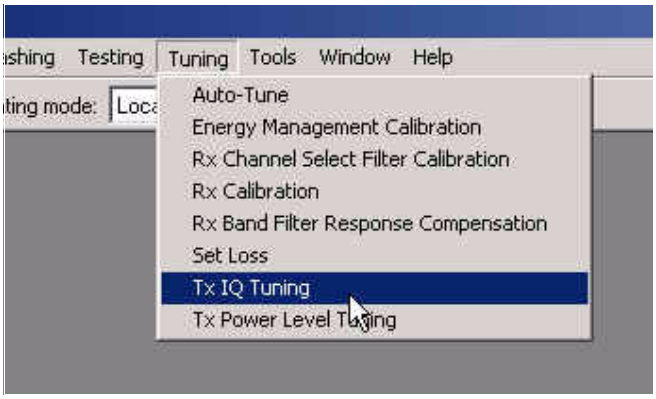
Tx IQ tuning allows changing the Tx I Dc Offset, Tx Q DC Offset, amplitude difference and phase difference. It must be performed separately on each band.

Prerequisites:

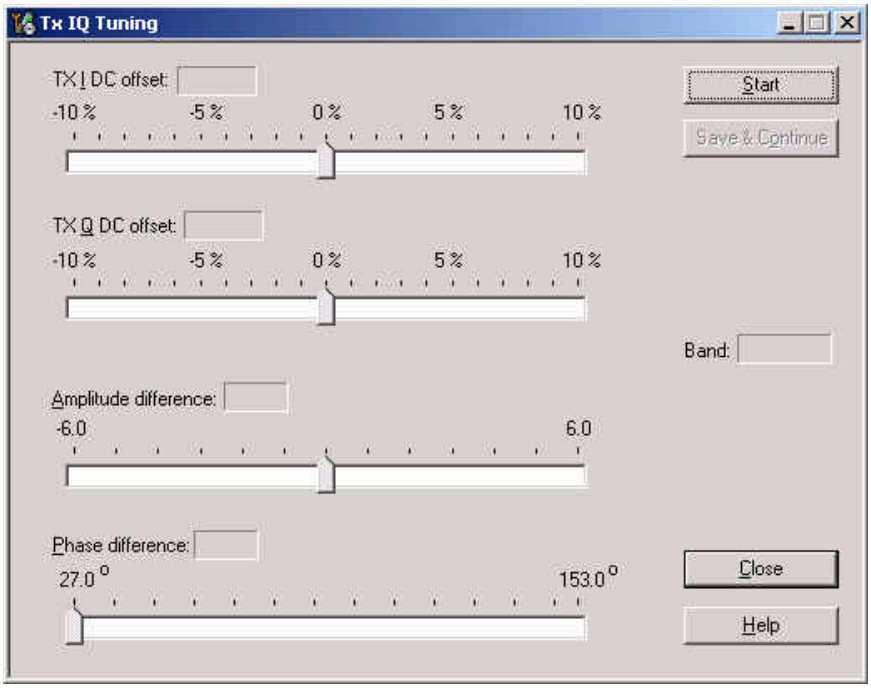
- A spectrum analyzer is needed to perform this tuning.
- Connect the phone according to the setup diagrams.
- Changing from GSM850 to GSM1900 is done automatically.
- Use the default settings for Rx/Tx channel, Tx data type and Tx PA mode.
- Remember to take into account jig and cable attenuations!

To start tuning:

1 From the Tuning menu, choose Tx IQ Tuning.



The following window appears:



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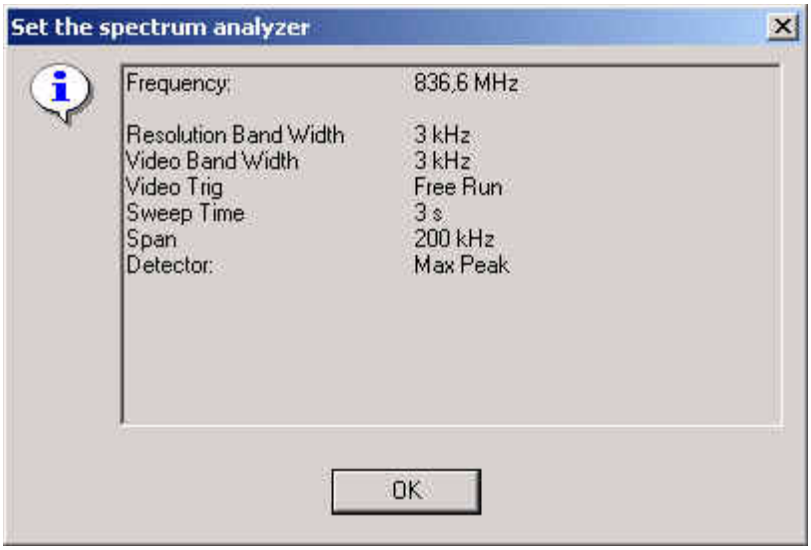
2 Click Start and tuning starts at the GSM850 band:



3 Enter these settings in the spectrum analyzer and click OK.

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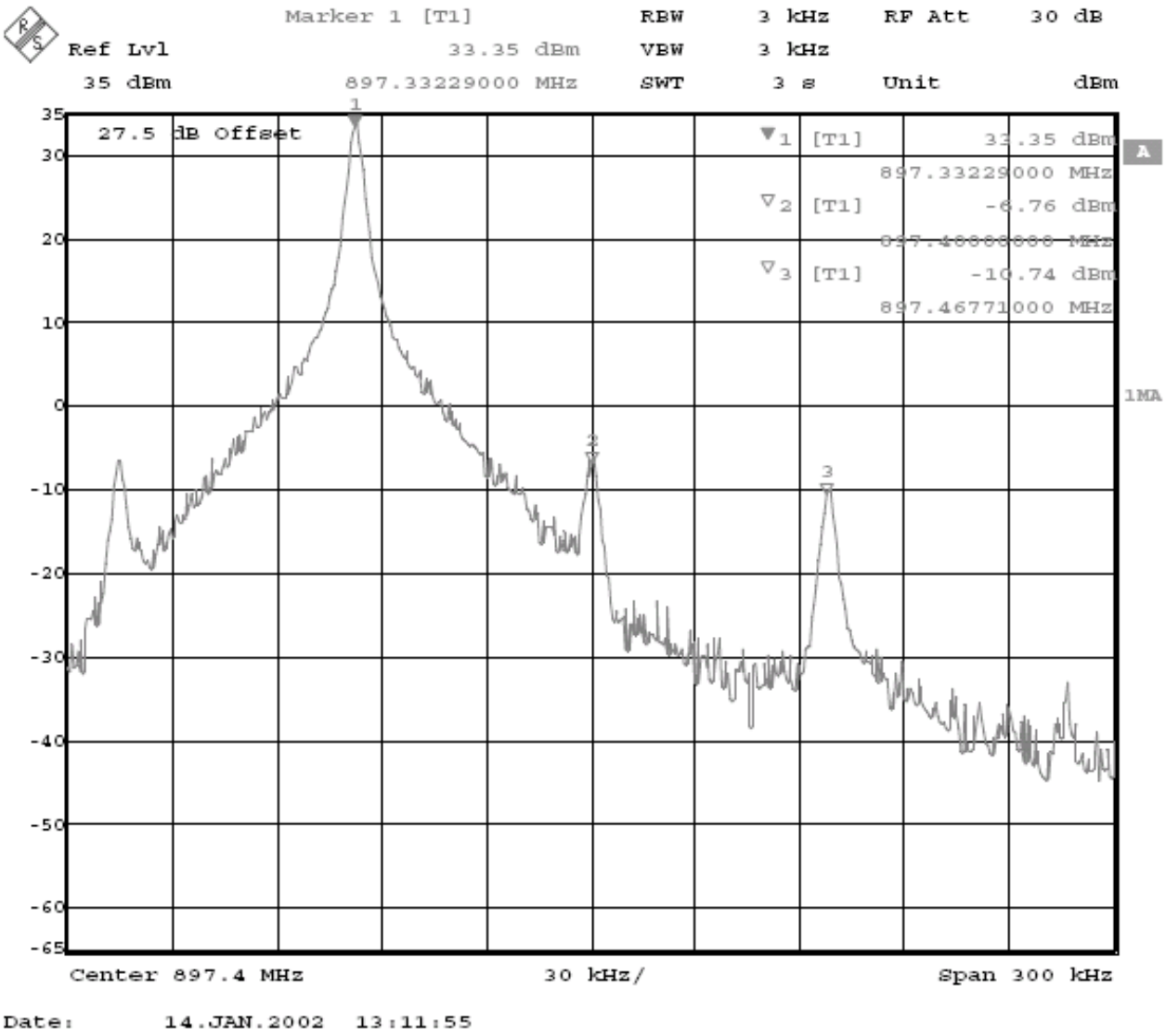
The spectrum analyzer shows a plot like this:



4 To move the slider, use "+" and "-" keys.

5 To adjust the carrier signal to a minimum level (Marker 2), use the variables "Tx I DC offset" and "Tx Q DC offset".

The purpose of this tuning is to tune the suppressed carrier signal and the first sidelobe signal to a minimum level (Marker 2 and Marker 3).

After tuning to the minimum the level difference between the peak levels at marker 1 and marker 2 must exceed 30 dB.

Tuning is possible by using arrow keys on the keyboard. Pushing the sliders by using the mouse is less sensitive.

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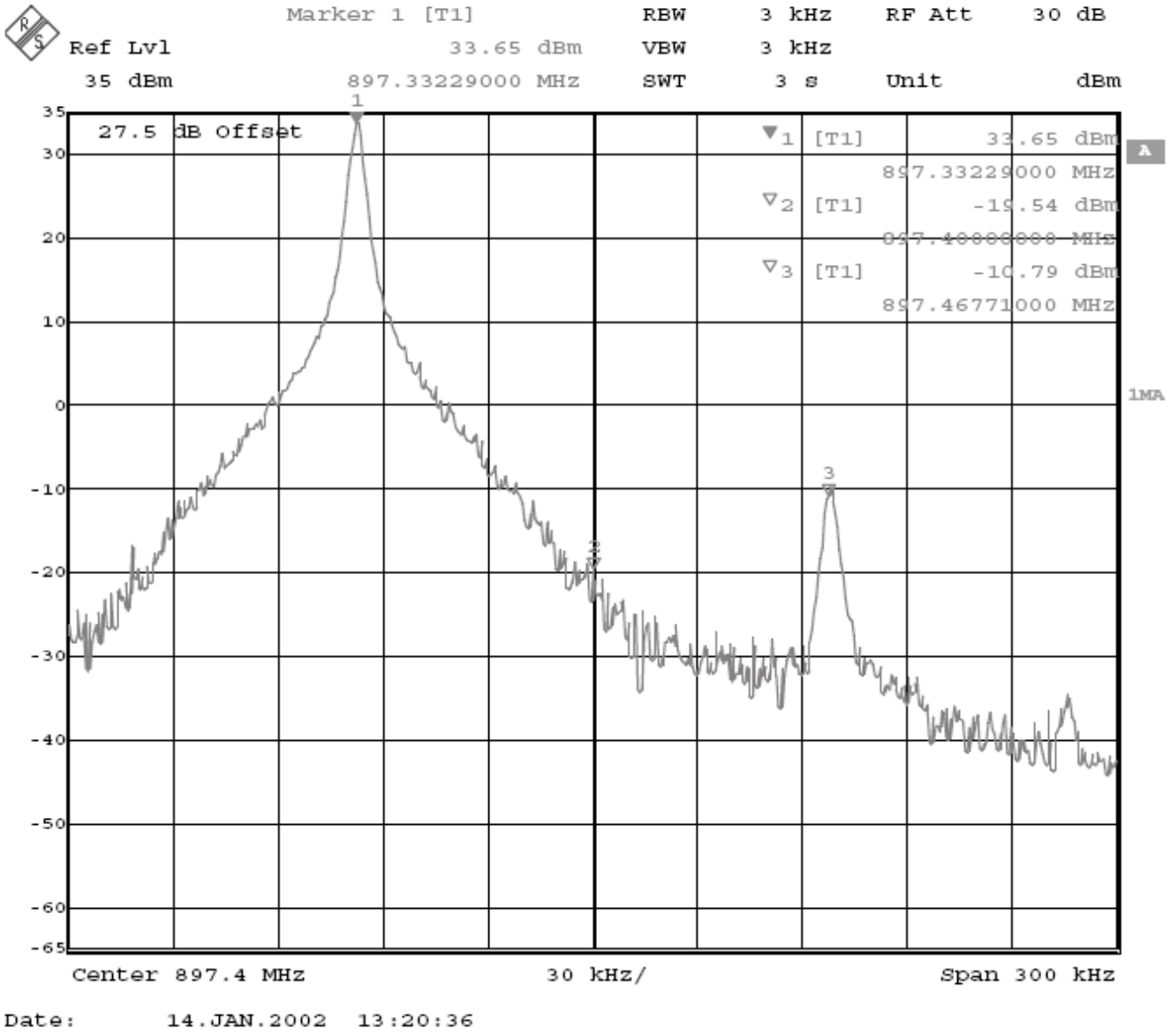
The spectrum analyzer shows a plot like this:



6 To adjust the +67kHz signal to a minimum level (Marker 3), use the variables "Amplitude difference" and "Phase difference".

After tuning to the minimum, the level difference between the peak levels at marker 1 and 3 must exceed 40 dB.

Tuning is possible by using arrow keys on the keyboard. Pushing the sliders by using the mouse is less sensitive.

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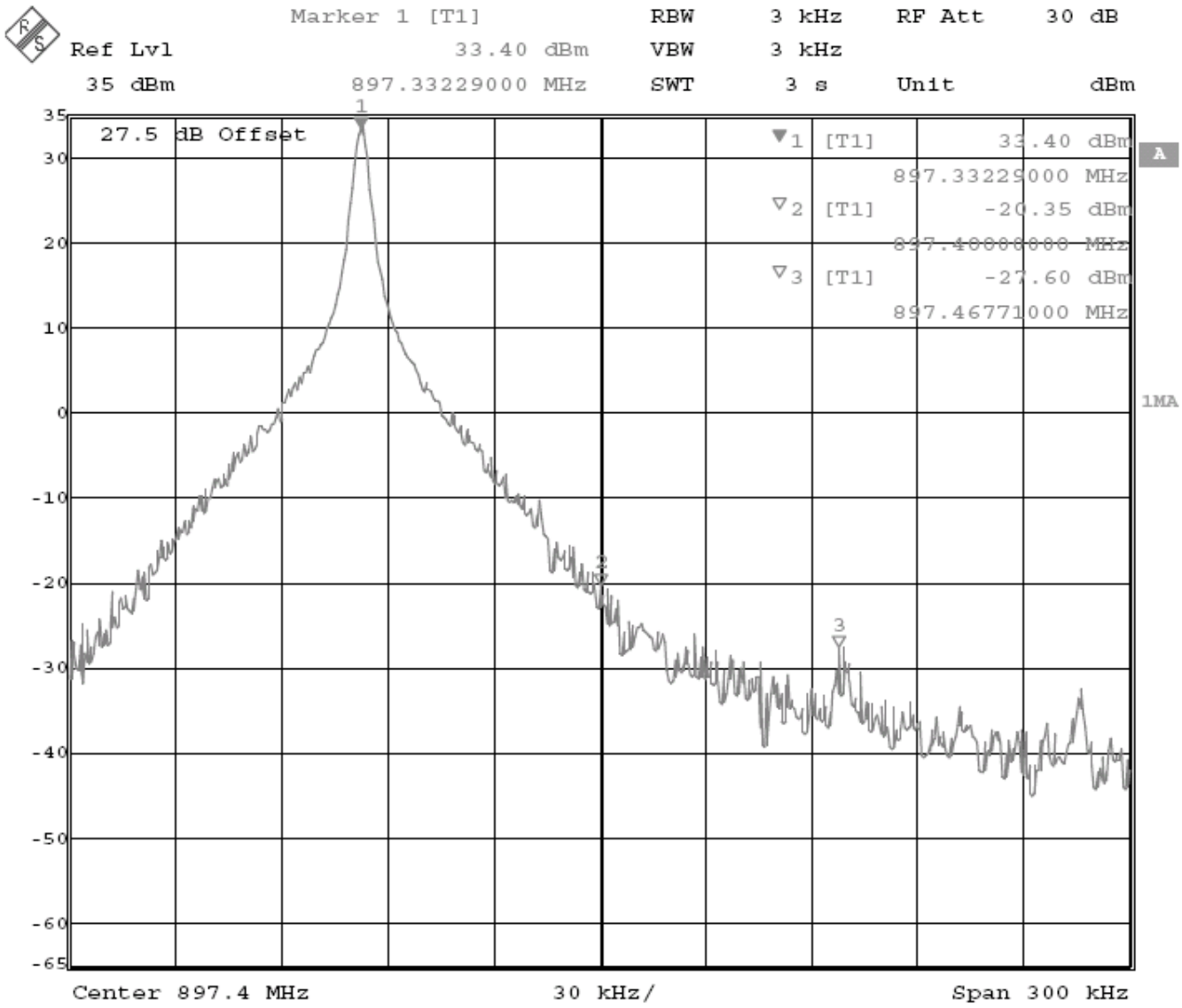
The spectrum analyzer now shows a plot like this:



Note! The optimal values for "Tx I and Q offset" and "Amplitude and phase difference" vary from phone to phone.

The GSM850 TX IQ tuning is now finished.

7 To proceed to the **GSM1900** band, click Save & Continue.

8 Set the spectrum analyzer according to the pop-up window.

9 Repeat the same steps as with **GSM850**.

10 Click Save & Continue.

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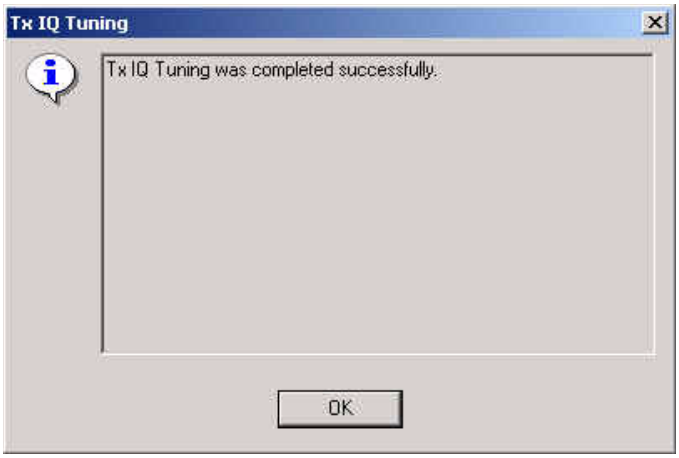
11 To finish the tuning process, click OK.



Tx power level tuning

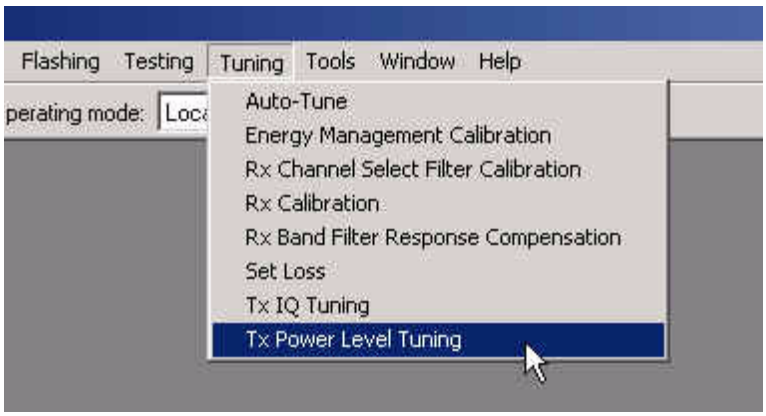
Prerequisites:

- A spectrum analyzer is needed.
- Connect the phone according to the setup diagrams.
- Turn on the **power meter** function of the spectrum analyzer used!

  Note: Use attenuator in order not to overload the spectrum analyzer.
- With Tx power level tuning, the coefficients are adjusted for each power level.
- Must be done separately on each band.
- Start power level tuning at GSM850, then continue at GSM1900 band.
- In GSM850 and GSM1900 bands the power level tuning is made only for high PA mode.
- Remember to take into account jig and cable attenuations!

To start tuning:

1 From the Tuning menu, choose Tx Power Level Tuning.



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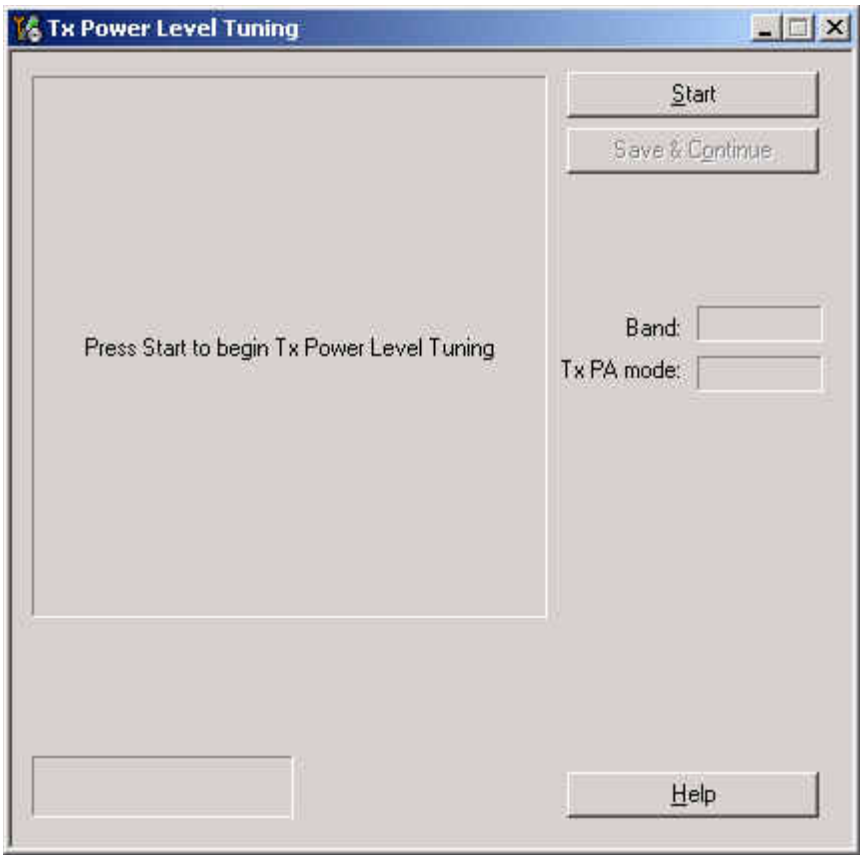
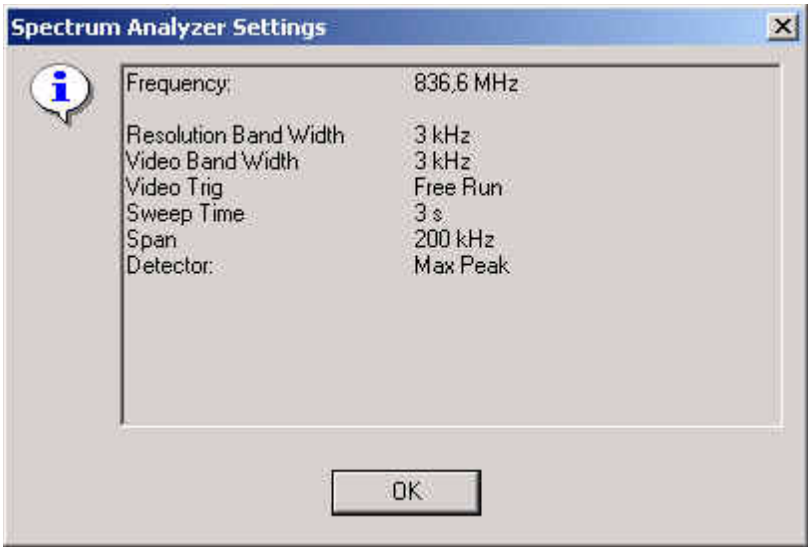
The following window appears.



2 Click Start and tuning starts at the GSM850 band:

3 Make the required adjustments of the spectrum analyzer as shown in the picture and click OK:



The coefficient table lists the power level coefficient, target dBm and DAC value for each power level.

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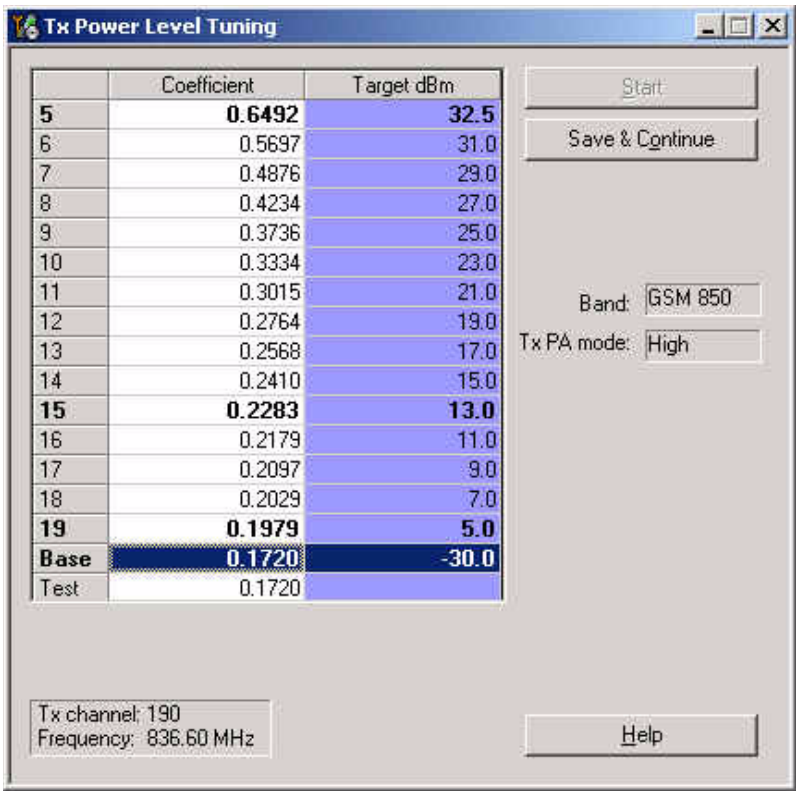
4 To choose the power level tuned, use the up and down arrows or mouse.

The current power level is shown with inverse colors.

Tuning value can be adjusted with "-" and "+" keys.

GSM850: Tune base level and power levels 19, 15 and 5 according to target level.

The power levels may differ from Phoenix mentioned target power levels!



5 To proceed to the **GSM1900** band, click Save & Continue.

6 Change the adjustments of the spectrum analyzer as shown in the picture and

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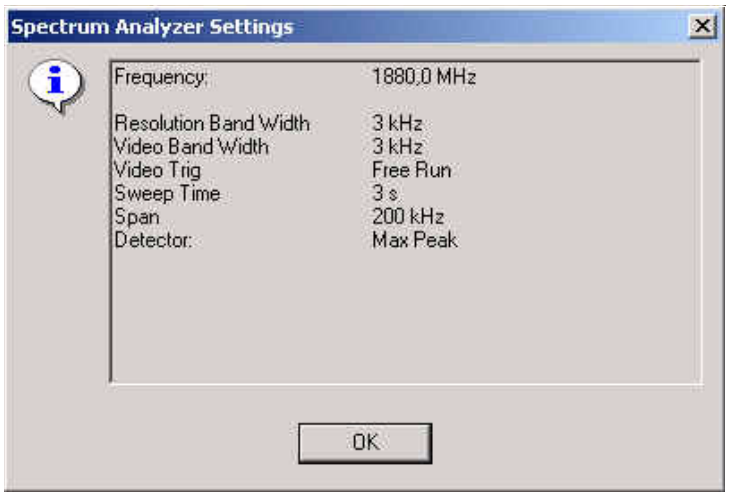
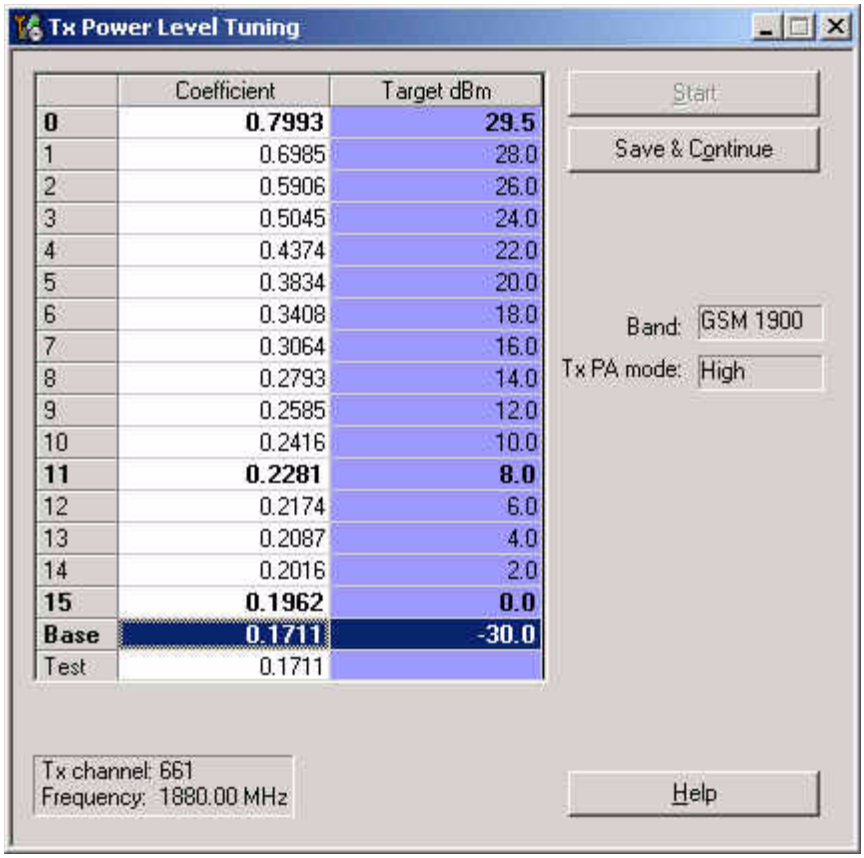
click OK:



GSM1900: Tune base level and power levels 15, 11 and 0 according to target level.

The power levels may differ from Phoenix mentioned target power levels!



7 To end the tuning process, click Save & Continue.

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RF autotuning

Component autotuning is designed to align the product's RF part easier and faster. It is performed automatically by simply clicking the Tune button. The product's Rf is tuned and the results are shown to the user. The Autotune component controls all the needed RF equipment (Rf generator and Tx measuring device), except the voltage supplier.

Autotuning is recommended for RH-47.

Autotune should be performed with JBV-1 and DA-17 inside a shielded box or with the MJ-21 repair jig.

The losses for the DA-17 coupler, MJ-21 repair jig and those for the RF cables used must be inserted in the "Set Loss" function of Phoenix.

Make sure that the **GPIB** card is initialized in Phoenix. To initialize the card, choose Tools -> Options -> GPIB card. The cards number, address, and type should be displayed there.

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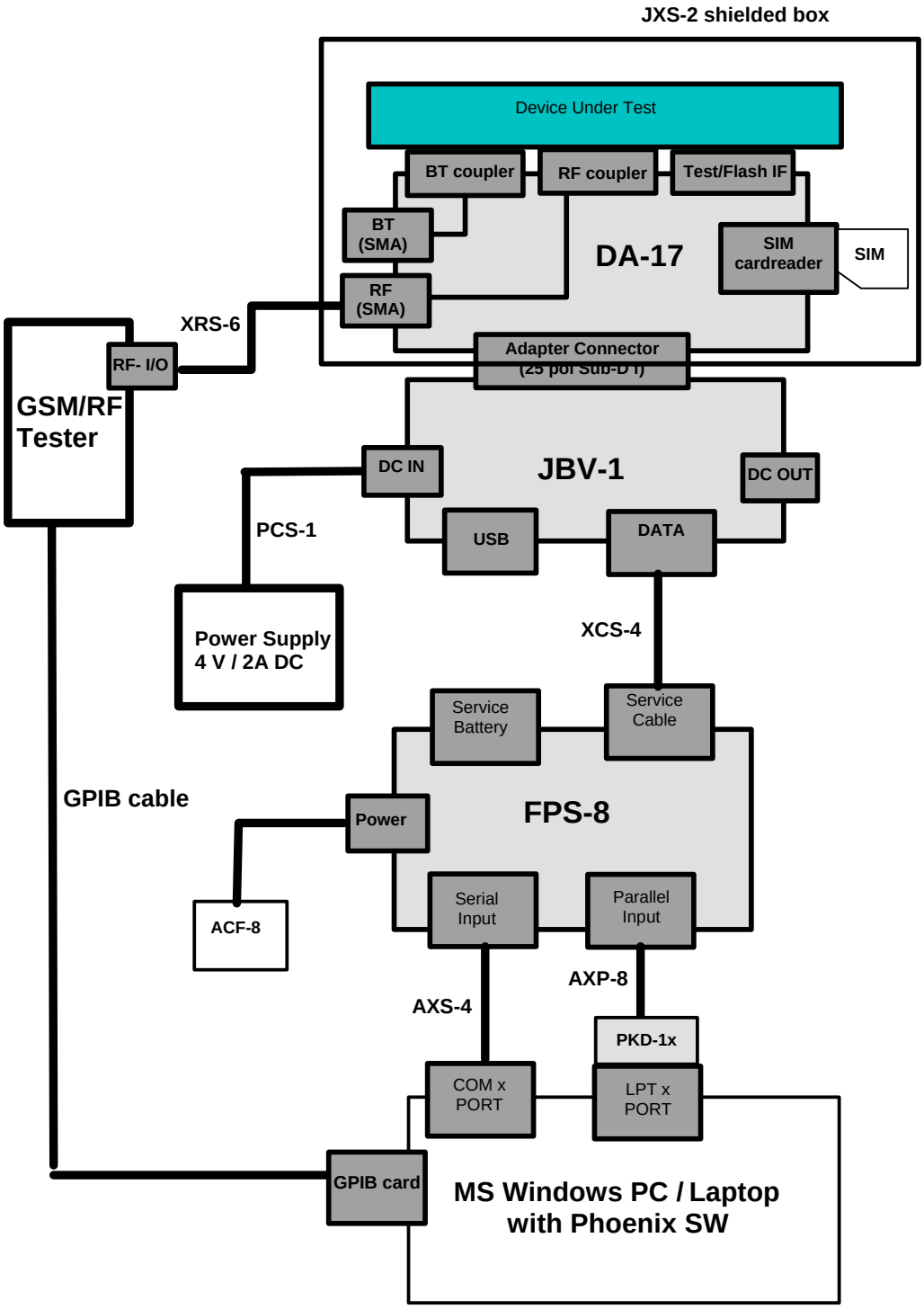
Setup Diagrams

Before proceeding with Autotune make sure you have one of the following setups built up.

Figure 4: Autotune with **DA-17** and a universal GSM/RF tester (e.g. **CMU-200**).



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Item	Type designation	Code	Description
1	DA-17	0770701	Docking Station adapter for JBV-1
2	JBV-1	0770298	Flash/Test docking station with generic data & power interfaces.
3	PCS-1	0730012	Power cable to connect e.g. JBV-1 to FPS-8.2 x Banana connectors to 5,5 mm DC plug
4	XCS-4	0730178	Modular cable for e.g. connection between FPS-8 and SF-20.
5	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
6	AXS-4	0730090	Serial cable 9 pole Sub-D - part of FPS-8 sales package!
7	AXP-8	0730298	Parallel bi-directional printer cable - part of FPS-8 sales package!
8	ACF-8	0680032	Power Supply – part of FPS-8 sales package.
9	XRS-6	0730231	RF cable to connect e.g. module repair jig to RF measurement equipment. SMA to N-Connector ca. 610mm
10	NA	NA	GPIB cable
11	NA	NA	GPIB card for PC (National Instruments compatible)
12	JXS-2	0770673	Optional shielded box for RF autotuning and testing in specific service environment in US.To be used with DA-1 adapter

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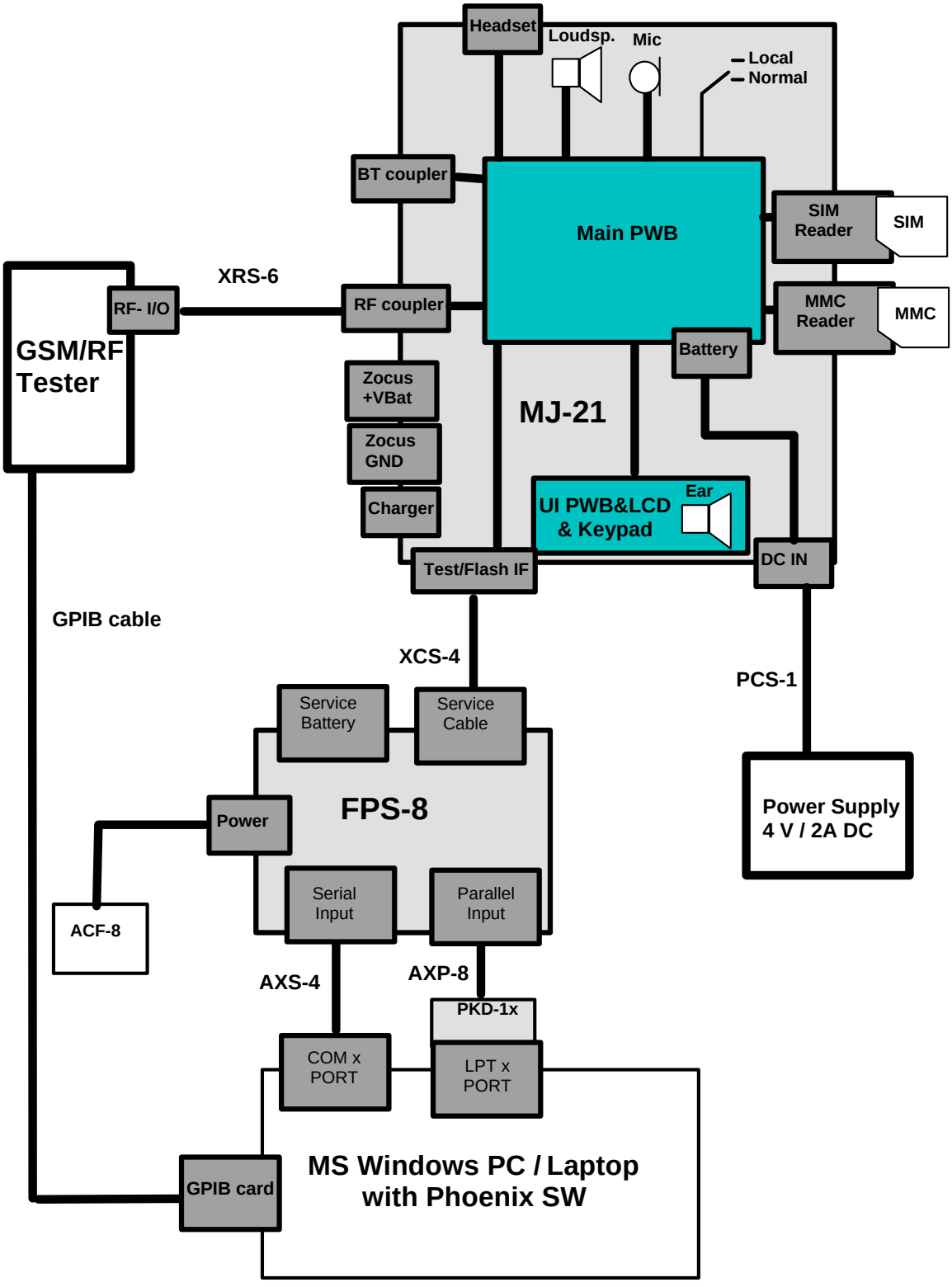
Figure 5: Autotune with MJ-21 and a universal GSM/RF tester (e.g. CMU-200)



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Item	Type designation	Code	Description
1	MJ-21	0770646	Module repair jig
2	XCS-4	0730178	Modular cable for e.g. connection between FPS-8 and SF-20.
3	PCS-1	0730012	Power cable to connect e.g. JBV-1 to FPS-8.2 x Banana connectors to 5,5 mm DC plug
4	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
5	AXS-4	0730090	Serial cable 9 pole Sub-D - part of FPS-8 sales package!
6	AXP-8	0730298	Parallel bi-directional printer cable - part of FPS-8 sales package!
7	ACF-8	0680032	Power Supply – part of FPS-8 sales package.
8	XRS-6	0730231	RF cable to connect e.g. module repair jig to RF measurement equipment. SMA to N-Connector ca. 610mm
9	NA	NA	GPIB cable
10	NA	NA	GPIB card for PC (National Instruments compatible)

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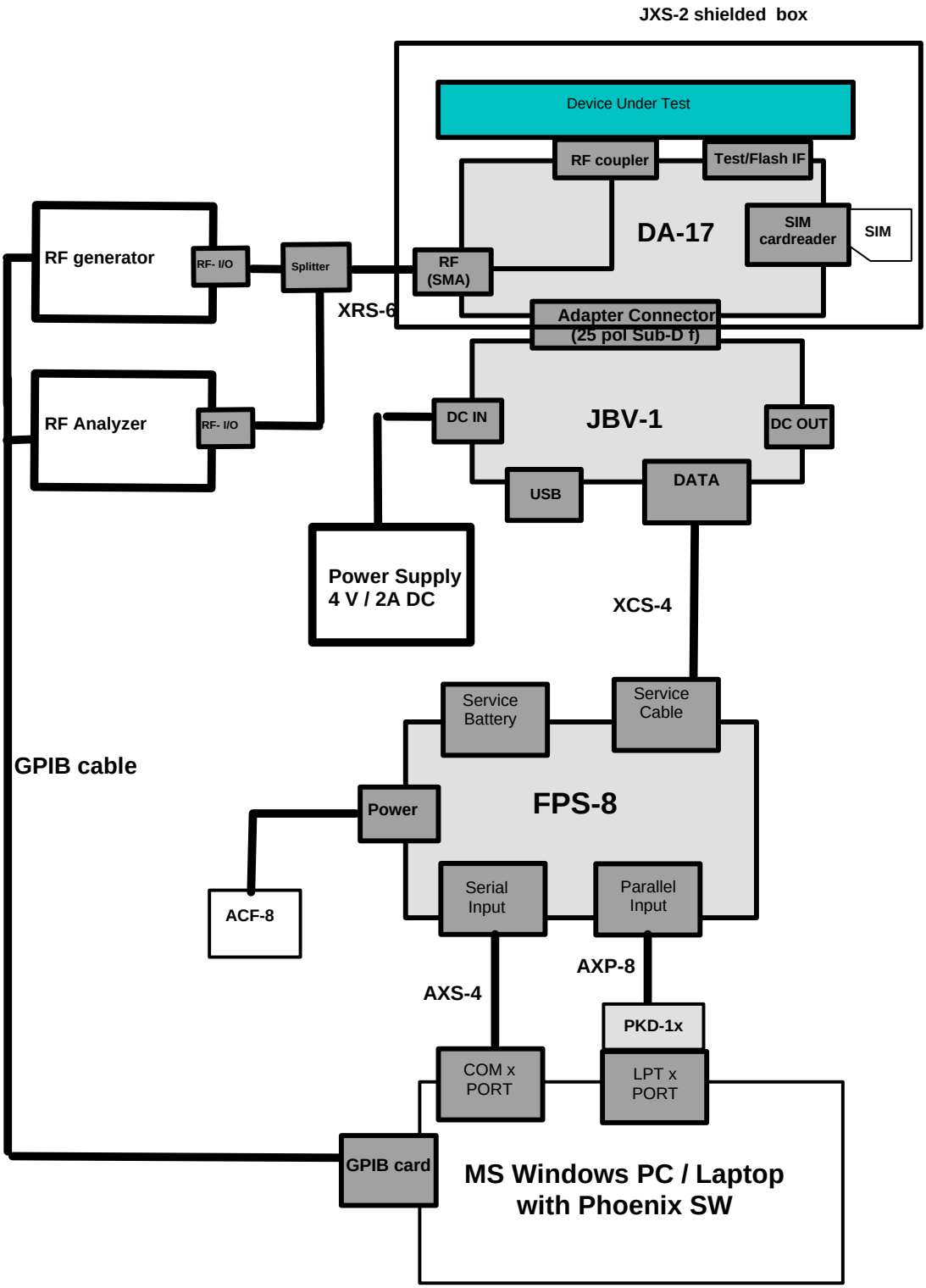
Figure 6: Autotune with DA-17 using RF Generator and RF Analyzer (e.g. Agilent VSA E4406 (Signal analyzer) and Agilent ESG (Signal generator).



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Item	Type designation	Code	Description
1	DA-17	0770701	Docking Station adapter for JBV-1
2	JBV-1	0770298	Flash/Test docking station with generic data & power interfaces.
3	PCS-1	0730012	Power cable to connect e.g. JBV-1 to FPS-8.2 x Banana connectors to 5,5 mm DC plug
4	XCS-4	0730178	Modular cable for e.g. connection between FPS-8 and SF-20.
5	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
6	AXS-4	0730090	Serial cable 9 pole Sub-D - part of FPS-8 sales package!
7	AXP-8	0730298	Parallel bi-directional printer cable - part of FPS-8 sales package!
8	ACF-8	0680032	Power Supply – part of FPS-8 sales package.
9	XRS-6	0730231	RF cable to connect e.g. module repair jig to RF measurement equipment. SMA to N-Connector ca. 610mm
10	NA	NA	GPIB cable
11	NA	NA	GPIB card (National Instruments compatible)
12	JXS-2	0770673	Optional shielded box for RF autotuning and testing in specific service environment in US.To be used with DA-1 adapter

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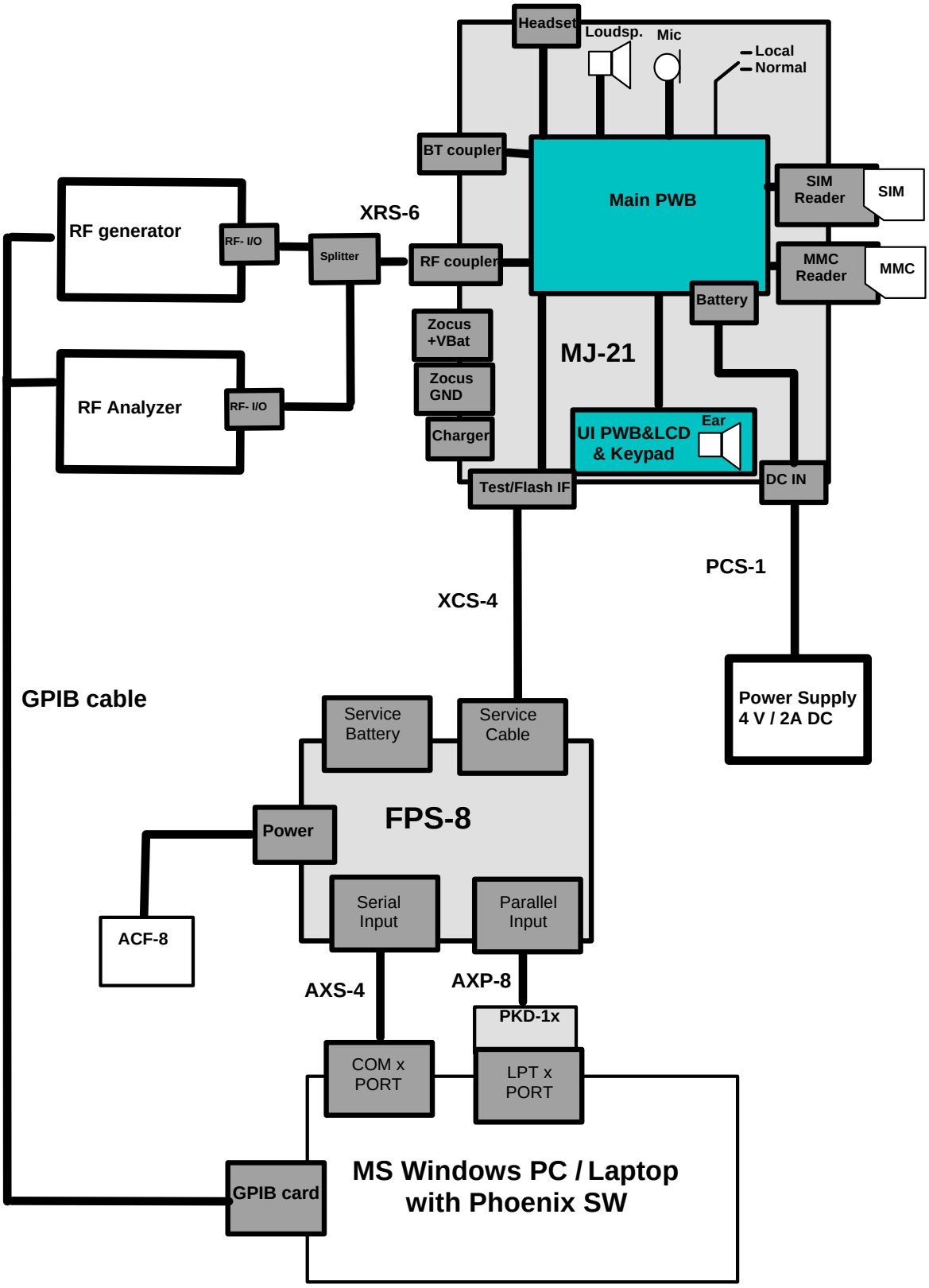
Figure 7: Autotune with MJ-21 using RF generator and RF analyzer (e.g. Agilent VSA E4406 (Signal analyzer) and Agilent ESG (Signal generator).



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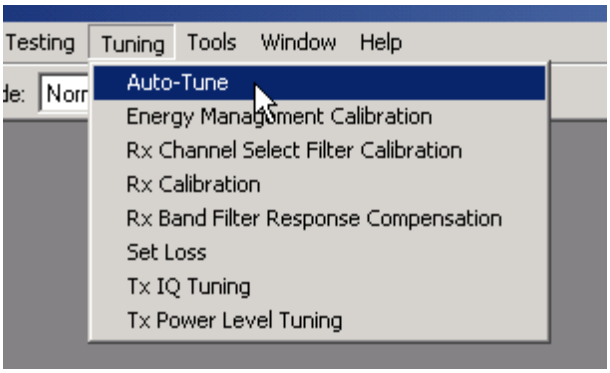
Item	Type designation	Code	Description
1	MJ-21	0770646	Module repair jig
2	XCS-4	0730178	Modular cable for e.g. connection between FPS-8 and SF-20.
3	PCS-1	0730012	Power cable to connect e.g. JBV-1 to FPS-8.2 x Banana connectors to 5,5 mm DC plug
4	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
5	AXS-4	0730090	Serial cable 9 pole Sub-D - part of FPS-8 sales package!
6	AXP-8	0730298	Parallel bi-directional printer cable - part of FPS-8 sales package!
7	ACF-8	0680032	Power Supply – part of FPS-8 sales package.
8	XRS-6	0730231	RF cable to connect e.g. module repair jig to RF measurement equipment. SMA to N-Connector ca. 610mm
9	NA	NA	GPIB cable
10	NA	NA	GPIB card for PC (National Instruments compatible)

Autotune procedure

1 Start Phoenix.

2 From the Tuning menu, choose Auto-Tune:



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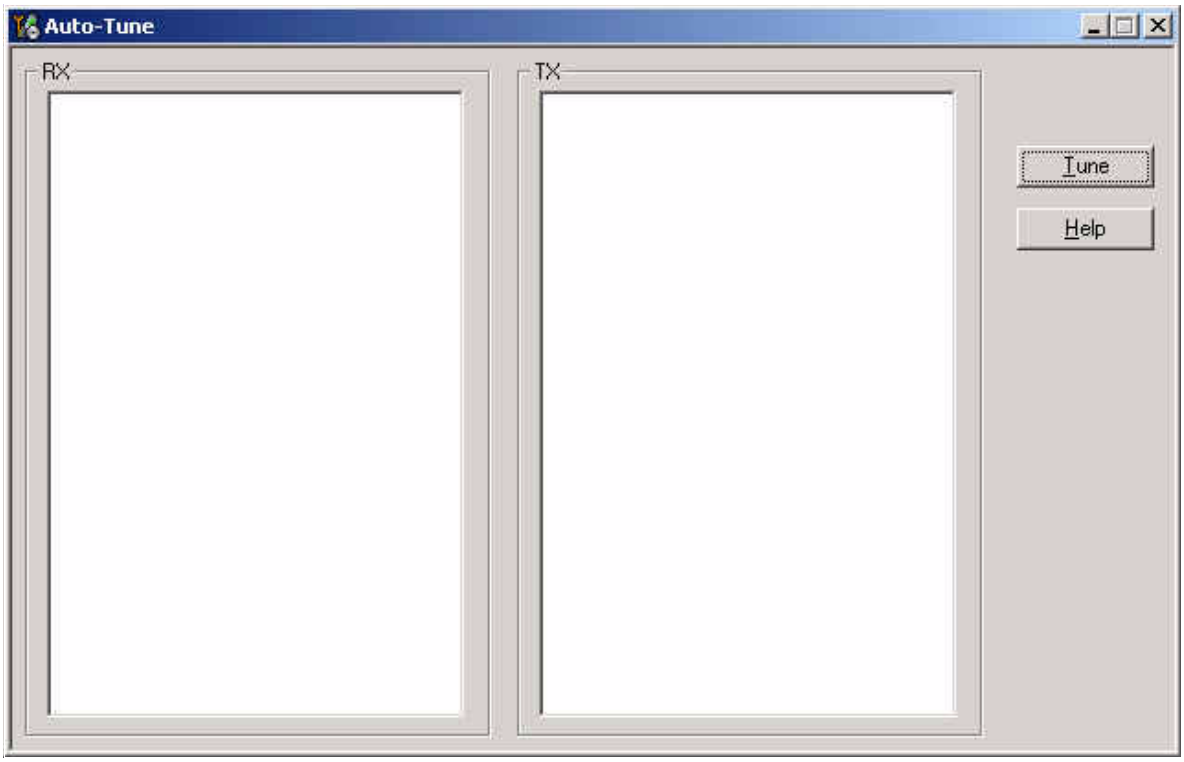
The following window appears:



3 Click Tune.

The phone turns to local mode automatically and autotune starts.

Wait until the tuning process has finished (about 1 minute). You see the follow-

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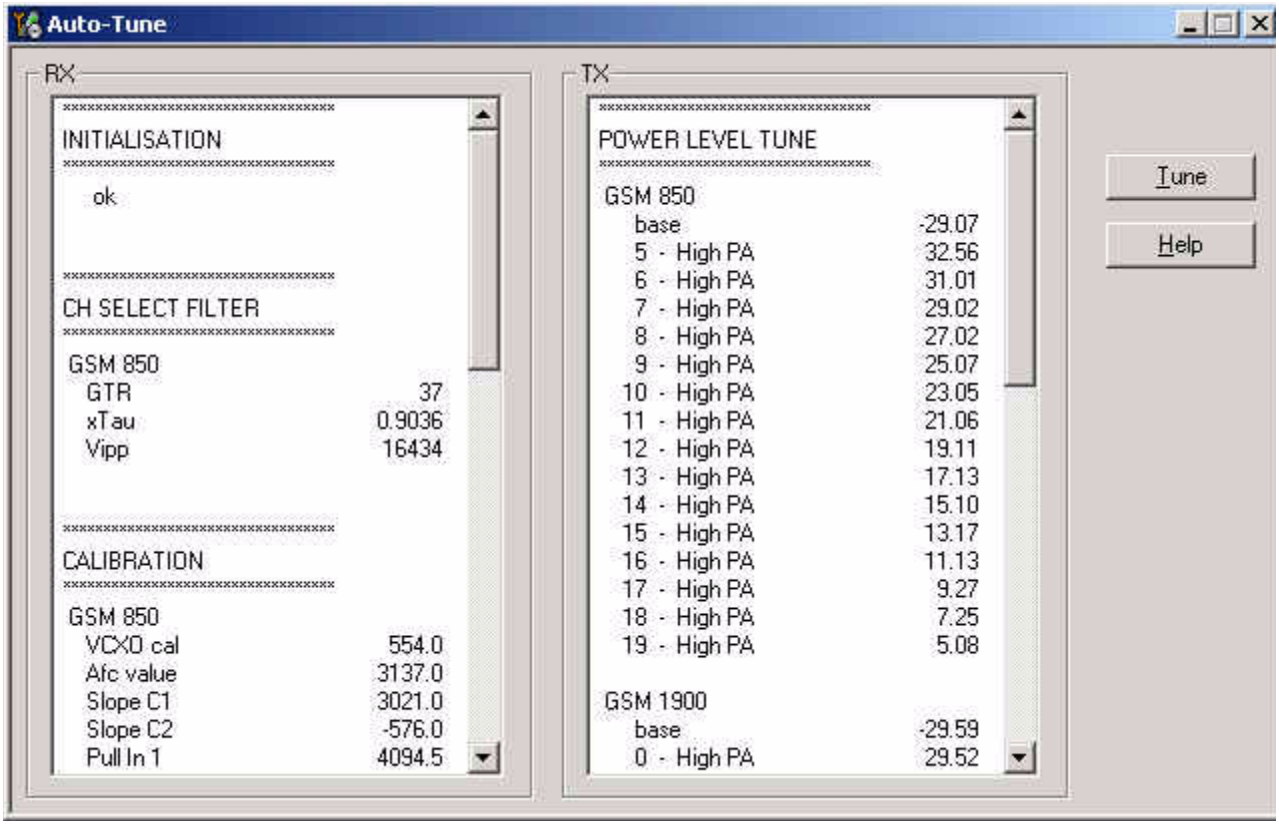
ing window:



4 To finish the tuning process close this window.

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Bluetooth Bit Error Rate Test

Hardware needed to use JBT-9

- JBT-9 Bluetooth test box
- SMA stub antenna (part of sales kit)
- ACP-8x charger (x denotes region, e.g. ACP-8E for Europe)

JBT-9 test box

The JBT-9 Bluetooth test box can be used without a PC connection as a loop-back device for BT testing. To verify the products BT functionality, a Bit Error Rate test needs to be performed against JBT-9. The test is controlled and executed by Phoenix service software.

JBT-9 test range

The JBT-9 test range is related to attenuation settings. The default factory setting of internal attenuation results in a RF level of –36dBm. This reduces the RF range up to **0.5 m**. In case that distance is too short to perform tests over the air, the internal attenuation can be changed as described in the chapter below.

In case a service jig is directly connected to the box SMA RF I/O connector via cable, it is recommended to work also with the maximum internal attenuation (default factory setting).

Performing BER test

1 Connect service jig's BT RF cable to JBT-9's RF/IO connector. Optional with DA-17; the JBT-9 stub antenna can be used instead of cable.

2 Connect an ACP-8x charger to JBT-9 power connector.

Make sure that distance between phone and JBT-9 does **not exceed ~ 0.5 m** distance when using default attenuation setting.

BER test result is OK when BER is **less than 0.1%**

Note! The phone connection to the PC is specific to the tested phone. For details refer to the related chapter in the service manual.

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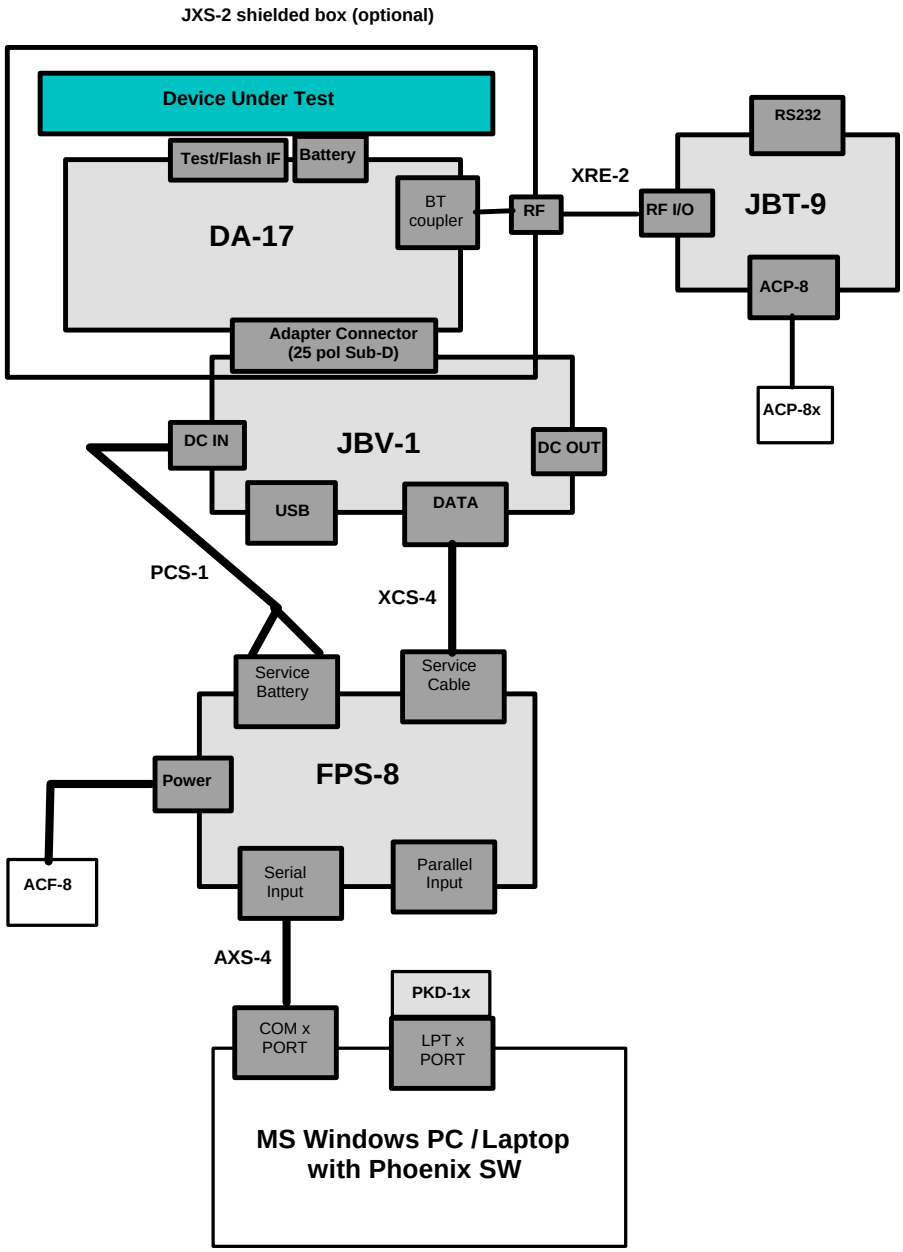
BER test with DA-17

There are several options to perform the BER test, e.g. with a cable connection or JBT-9 antenna. The test setup used depends on environmental conditions and service level.



Item	Type designation	Code	Description
1	DA-17	0770701	Docking Station adapter for JBV-1
2	JBV-1	0770298	Flash/Test docking station with generic data & power interfaces.
3	PCS-1	0730012	Power cable to connect e.g. JBV-1 to FPS-8.2 x Banana connectors to 5,5 mm DC plug
4	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
5	AXS-4	0730090	Serial cable 9 pole Sub-D - part of FPS-8 sales package!

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6	ACF-8	0680032	Power Supply – part of FPS-8 sales package.
7	JBT-9	81490	Bluetooth Test & Interface Box
8	ACP-8E	0675195	Charger for JBT-9 Output: 5.3V DC, 500 mA; Europe. Version

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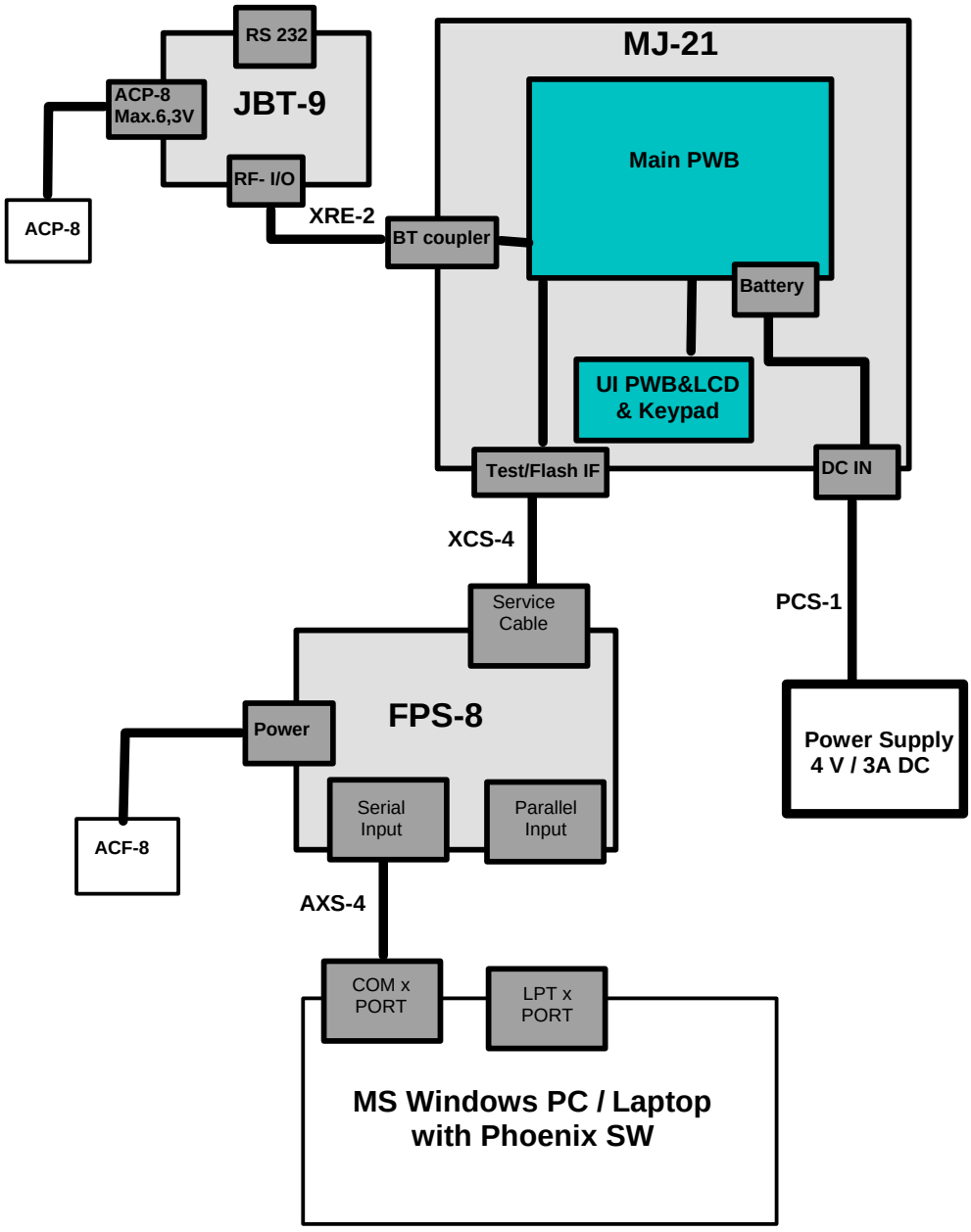
BER test with MJ-21

MJ-21 is another option to perform BER test on module level.



Item	Type designation	Code	Description
1	MJ-21	0770646	
2	PCS-1	0730012	Power cable to connect e.g. JBV-1 to FPS-8.2 x Banana connectors to 5,5 mm DC plug
3	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
4	AXS-4	0730090	Serial cable 9 pole Sub-D - part of FPS-8 sales package!
5	ACF-8	0680032	Power Supply – part of FPS-8 sales package.

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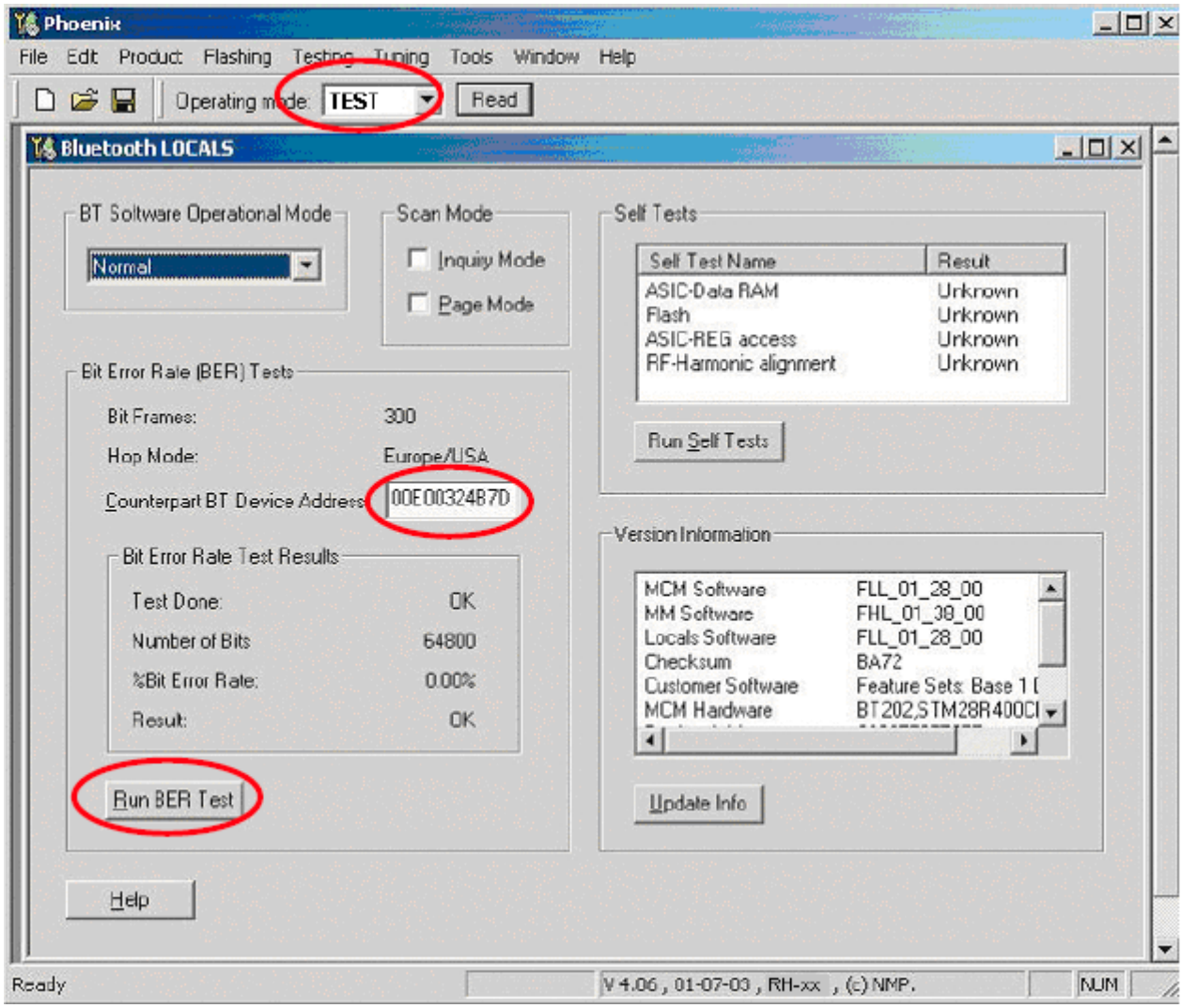
6	JBT-9	81490	Bluetooth Test & Interface Box
7	ACP-8	0675195	Charger for JBT-9 Output: 5.3V DC, 500 mA; Europe. Version

Testing instructions for BER testing

1 Make sure that the phone's product support modules are properly loaded by Phoenix SW.

2 Set phone into Operating mode **"*TEST*"**

3 From the Testing menu, choose "Bluetooth LOCALS".



4 Enter JBT-9's Ser.No. (12 digits from the type label) in the field "Counterpart Device Address". This has only to be done once as long as JBT-9 is not changed!

Standard testing parameters as bit frames, hopping mode and number of bits are default settings by Phoenix. BT Software Operational Mode = Normal Mode.

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5 To perform the BER test, click the "Run BER Test" button.

"Test done" means that test has successfully been performed; if Bit Error Rate is </= 0.1% the "Result" will be also displayed as "OK".

Additional menu functions

BT MCM related self-tests can be performed by clicking "Run Self Tests". Results have to be "PASSED".

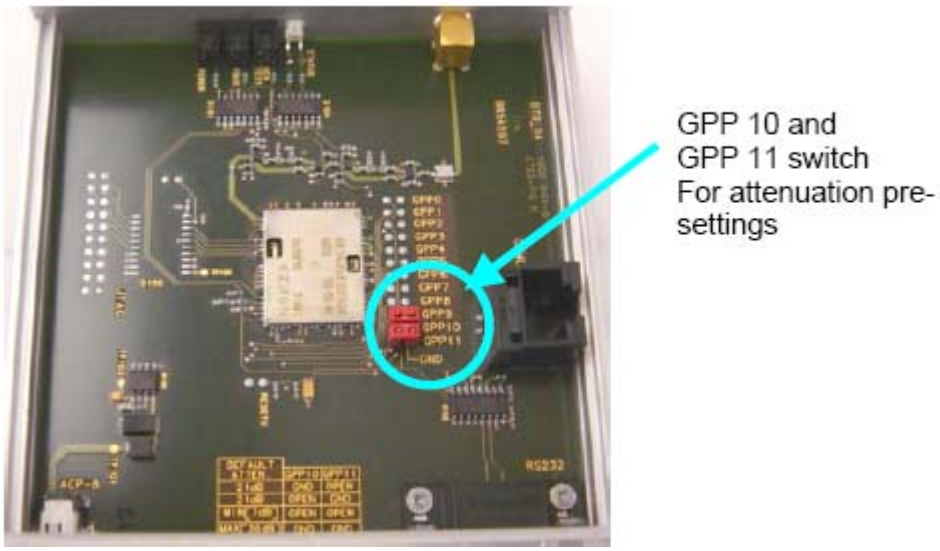
The "Version Information" dialog gives you BT MCM related detail information that could be necessary in case of detailed fault reporting.

Other settings like "Scan Mode" or "BT Software Operational Mode" are only necessary to change in case of special device analysis in combination with e.g. commercial BT testsystems.

JBT-9 attenuation setting via jumper

Internal possible settings for attenuation after JBT-9 boot-up are listed below. 29 dB is default setting.

Attenuation	Typical output power (+/- 5 dB)	GPP10	GPP11	Typical RF range
14 dB	- 21 dBm	Closed (GND)	Open	< 1,5 m
14 dB	- 21 dBm	Open	Closed (GND)	< 1,5 m
0 dB	- 7 dBm	Open	Open	< 10 m
29 dB	- 36 dBm	Closed (GND)	Closed (GND)	< 0,5 m



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LED Indication of JBT-9

ACTION	STATUS-LED	BER TEST-LED	FBUS-LED	POWER-LED
POWER				ON
FBUS			ON	
INQUIRY		BLINKING		
CONNECTED		ON		
BER-TEST		ON		
LOOP-BACK		ON		
ERROR	ON RED			
BOX READY	ON GREEN			

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Audio Test

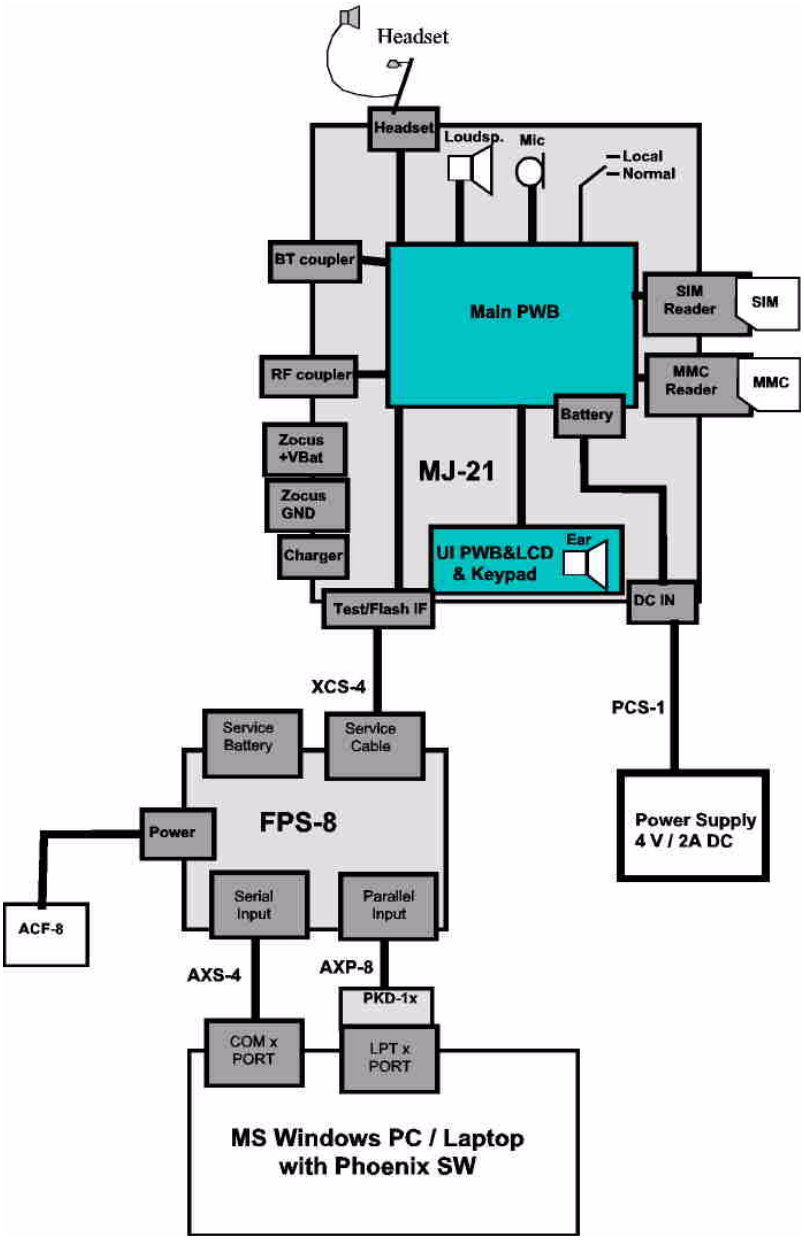
Audio testing is used to test the integrated in the phone speakers as well as looping of signals within predefined paths.

A headset is needed.

Audio test is performed using a MJ-21 module jig.

Setup diagram

The following setup is required to run audio test on engine board level.



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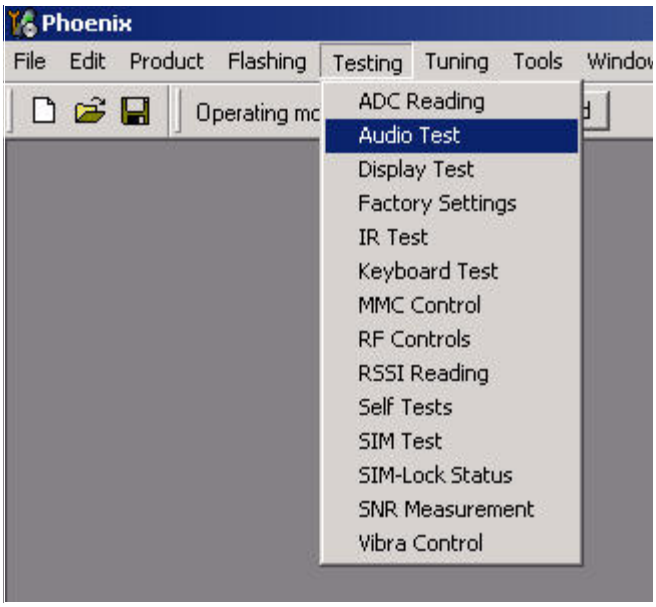
Item	Type designation	Code	Description
1	MJ-21	0770646	Module repair jig
2	XCS-4	0730178	Modular cable for e.g. connection between FPS-8 and SF-20.
3	PCS-1	0730012	Power cable to connect e.g. JBV-1 to FPS-8.2 x Banana connectors to 5,5 mm DC plug
4	FPS-8	0080321	Flash Prommer to be used with SF-20 or JBV-1 plus product specific adapter.
5	AXS-4	0730090	Serial cable 9 pole Sub-D - part of FPS-8 sales package!
6	AXP-8	0730298	Parallel bi-directional printer cable - part of FPS-8 sales package!
7	ACF-8	0680032	Power Supply – part of FPS-8 sales package.
8	HS-7	0694228	Dual Mono Headset

Audio test procedure

1 Set the phone to **TEST** mode.

2 From the Testing menu, choose Audio Test.



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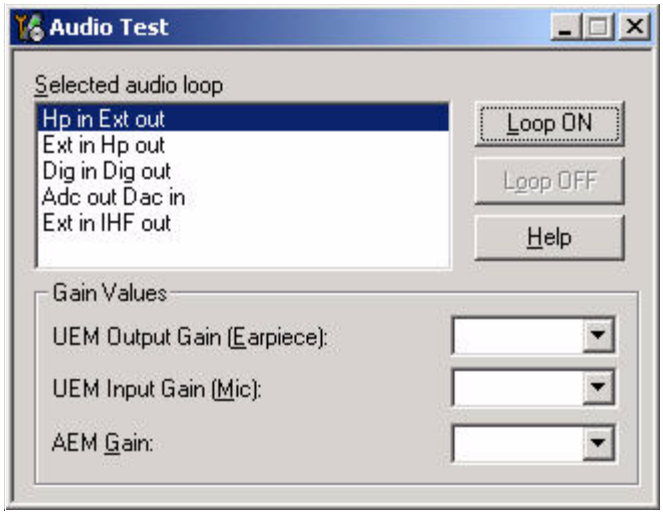
The following window appears:



The most important audio tests are: **Hp in Ext out, Ext in Hp out** and **Ext in IHF out:**

Hp in Ext out: the signal is routed from the phone's microphone to an external speaker (e.g. headset).

Ext in Hp out: the signal is routed from an external microphone (e.g. headset) to the phone's speaker.

Ext in IHF out: the signal is routed from an external microphone (e.g. headset) to the integrated in the phone *hands free* speaker.

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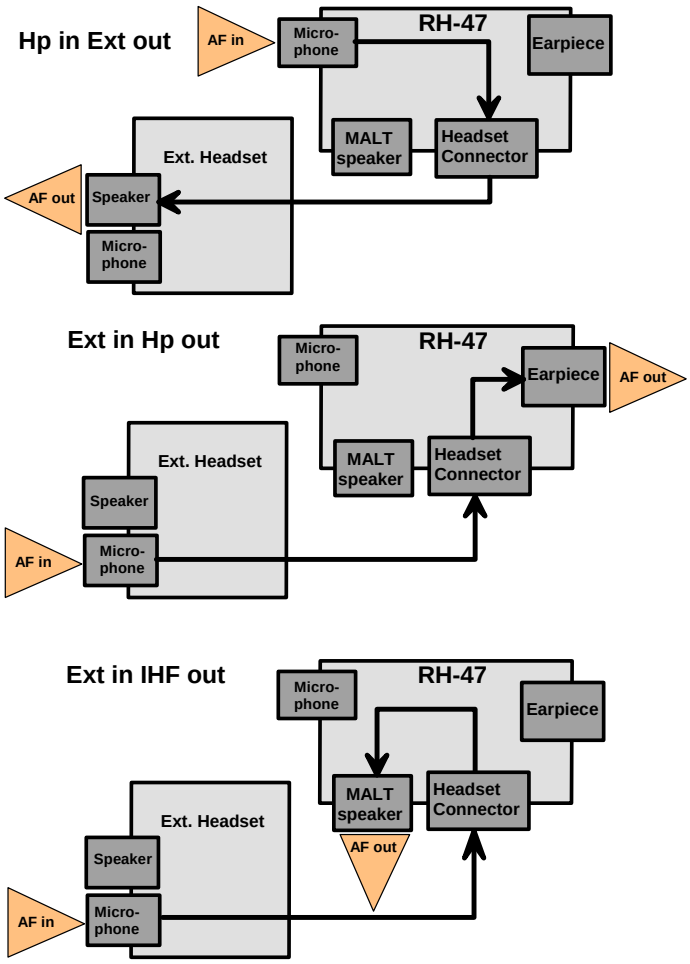
Audio signal routing



The order in which you perform the tests has no importance.

Test procedure:

1 Select a test from the list and click **Loop ON.**

2 Apply an acoustic signal to the respective input (e.g. when testing **Hp in Ext out** you should apply an acoustic signal to the phone's microphone).

3 The acoustic signal will be looped to the respective output. (e.g. when testing **Hp in Ext out** you will hear the acoustic signal at the headset's speaker)

4 During each test you can change the **UEM output** and **input gain** to several val-

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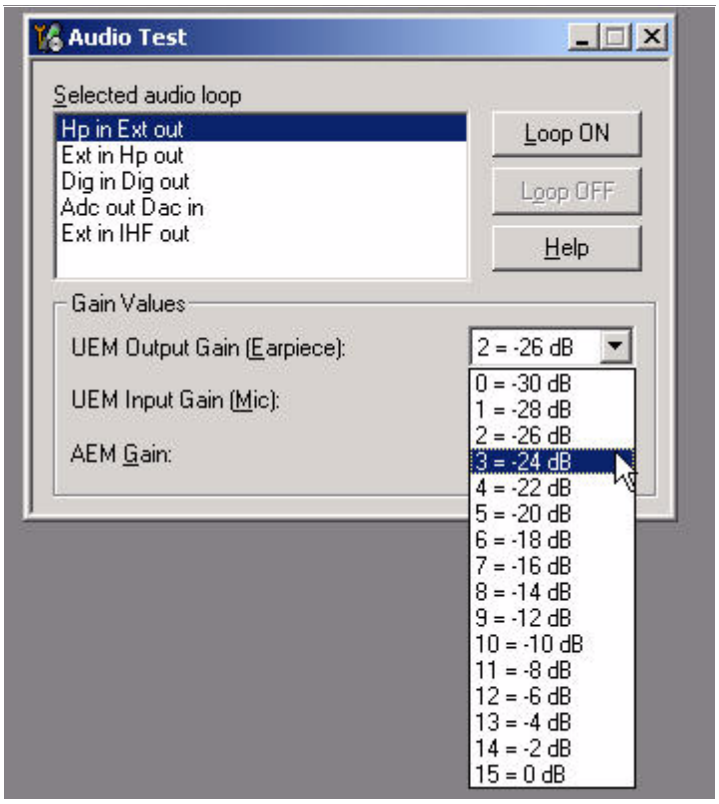
ues. This affects the volume of the routed signal.



5 To finish the testing process, close the Audio Test dialog.

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Phoenix Error Codes

Below is a list of some Phoenix errors that may come up, for example, during re-flashing operations. The table also describes the possible root causes in HW.

Phoenix Failure Code	Phoenix Failure Description	Possible Problems / Analysis	Proposed Action
C686, C684	Phone fail response received	This failure may occur during flash programming. When programming, the sequence is from D311 (about 80s) to D312 (about 30s). When erasing, the sequence is from D311 (about 130s) to D312 (about 70s). The position reveals which device causes the failure. Also check the chip enable signals during flashing at J311 and J312.	Change defect flash (D311 or D312) Known with Samsung devices!
C108	External RAM test failed	SDRAM has a connectivity problem to UPP or SDRAM power supplies missing. Probably a defect component. Before changing the component check SDRAM power supplies (VIO) and the clock at R101.	Change SDRAM (D310)
C385	Data block handling timeout	This failure may happen during erasing the BT memory in the beginning of the flashing process. Probably the BT module (N430) is defect. Before changing the BT module, check the BT power supplies (VAPPL, VCC, VREG). Also check the CBUS lines between the BT module, Zocus (N380) and UPP (D100).	Change BT module (N430)
C105, C106	Secondary length receive fail	This failure may occur when the length of the secondary boot strap code is send to the phone, following that the complete secondary boot strap code is send to the phone. Once the USART is initialized the length of the code correctly, the FBUSRX/TX line is toggled to acknowledge the prommer.	Check FBUSRX/TX line. Should be 1.8V.
A387	Wrong MCU ID	This failure may occur when the boot code instructs the MCU to send the ASIC version ID to the prommer. The prommer can then select the correct secondary boot code. Thus any prommer can reflash any DCT4 ASIC. Check the reported UPP ID. Is it right? If not it could be a data bus error. Also check the SW built for this ASIC type and version.	Does the signal toggle? Check VCOREA and RFCLK.
C101	Boot timeout fail	This failure may occur when the MCU comes out of reset and begins to start the boot code. Check the voltage of VFLASH1 and VCOREA. Check the connection between UPP and UEM (MBUSRX/TX 1.8V).	Change UPP (D100) or UEM (D190)

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C102	Boot start TxD up fail	This failure may occur when the prommer does not detect FBUSRX/TX or MBUS is going high. Check the FBUSRX/TX connection between the prommer and UEM. Also check VBAT and BSI connection.	Change UEM (D190)
C202	Algorithm send failed	This failure may occur when the phone does not correctly receive the algorithm code or cannot run the code that is received.	Check the RFCLK. Is it stable and at the correct frequency? Also check MCU voltages (VIO, VCOREA).
A204	Wrong manufacture and dev ID	The flash manufacturer and the device IDs in the existing algorithm files do not match with the IDs received from the target phone.	Update FPS-8 application SW version. FPS-8 is a HW prototype.
C103	Boot serial line fail	The phone MCU has not received the first dummy word correctly from the prommer after the startup.	check all connections to the device.
C583	No message ACK from the phone	The prommer has not received the phone acknowledge to the message. The prommer copies the message contents to the preceeding FIASCO_GENERAL_INFO_IND message.	Change Flash (D311)

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